3.3.1.1. Number of research papers in the Journals notified on UGC CARE list year wise during the last five years

ACHARYA NARENDRA DEV COLLEGE

UNIVERSITY OF DELHI

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All India NIRF 2022 Ranking-18, NAAC Score-3.31

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3.3 RESEARCH PUBLICATIONS AND AWARDS
SUPPORTING DOCUMENT FOR 3.3.1.1

3.3.1.1: Number of research papers in the Journals listed year wise during last five years. (Institute wise)

S. No.	Year	Number of research papers
1	2017	44
2	2018	51
3	2019	42
4	2020	61
5	2021	68
6	2022	107
	Total	**373**

Dr. Sada Nand Prasad
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3.3 RESEARCH PUBLICATIONS AND AWARDS
SUPPORTING DOCUMENT FOR 3.3.1.1

3.3.1.1: Number of research papers in the Journals listed year wise during last five years. (Teacher wise)

S. No.	Year	Number of research papers
1	2017	72
2	2018	95
3	2019	70
4	2020	118
5	2021	115
6	2022	172
	Total	**642**

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SUPPORTING DOCUMENT FOR 3.3.1.1

3.3.1.1: Number of research papers in the Journals listed year wise during last five years. (Institute wise)

13	Distinct detection of liquor ammonia by ZnO/SAW sensor: study of complete sensing mechanism.	13
14	Sensitivity Enhancement Studies of SAW vapor sensor by oscillator tuning using Varactor diode	14
15	Alterations in the reactive oxygen species in peripheral blood of chronic myeloid leukemia patients from Northern India	15
16	An analysis upon various strategies for redesign and direct evolution of enzyme engineering	16
17	Comparative study of removal of Cu and Pb from aqueous solution by using modified rice husk ask as an adsorbent	17
18	Developing a low cost activated carbon from agricultural waste for the removal of heavy metal from cotaminated waste	18
19	Sportsmen's energy package Cordyceps sinensis: Medicinal importance and responsible phytochemical constituents	19
20	Online signature verification: A review	20
21	Comparative analysis on path planning algorithm's on mobile robot in image processing	21
22	Impact of DDA optimization on mobile robot path planning for mixed image in image processing	22
23	Target assignment in robotics and its distance optimality using DDA optimization in image processing	23
24	Mobile robot path planning approach: A review	24
25	Architecture based on environmental monitoring system using zigbee wireless sensor networks	25
26	Low power consumption in zigbee wireless networks: A, review	26
27	Society and Sex Work in *The Autobiography of a Sex Worker by* Nalini Jameela.	27
28	The White Woman's Gaze	28
29	Free and open source software: A key enabler for digital India	29
30	Nanosecond Laser- Cluster Interactions at 109-1012 W/cm2	30
31	Pulse compression and self focusing of Gaussian laser pulses in plasma having relativistic ponderomotive nonlinearity	31
32	Detection of liquefied petroleum gas below lowest explosion limit (LEL) using nanostructured hexagonal strontium ferrite thin film	32
33	Growth and characterization of sol-gel processed rectangular shaped nanostructured ferric oxide thin film followed by humidity and gas sensing	33

53	Floral contrivances and specialised pollination mechanism strongly influence mixed mating in Wrightia tomentosa (Apocynaceae).	53
54	Relative contribution of reproductive attributes to the density-dependent effects on fruit-set.	54
55	Heteroleptic metal(II) complexes of curcumin and 2,2'-bipyridine: Synthesis, characterization, molecular modeling and preliminary antimicrobial investigation.	55
56	A highly selective sensor Cu2+ and Fe3+ ions in aqueous medium: Spectroscopic, computational and cell imaging studies.	56
57	A highly selective sensor Cu2+ and Fe3+ ions in aqueous medium: Spectroscopic, computational and cell imaging studies.	57
58	Protective effects of Aporosa octandra bark extract against D-galactose induced cognitive impairment and oxidative stress in mice.	58
59	Social Centrality using network hierarchy and community structure.	59
60	Bandwidth Efficient Broadcast Protocols in MANETs: A Review	60
61	Structural and optical properties of electrochemically deposited ZnOnanorods by using graphene oxide and ITO as substrate material: A comparative study	61
62	Comparison of water purification properties of Graphene Oxide (GO) Membranes with tuned interlayer spacings,	62
63	Sonication Effect on Graphene Oxide (GO) Membranes for Water Purification Applications"	63
64	Circular restricted three-body problem when both the primaries are heterogeneous spheroid of three layers and infinitesimal body varies its mass	64
65	An EOQ Model for Deteriorating Items with Selling Price Dependent Exponential Demand for Time Varying Holding and Deterioration Costs	65
66	A production inventory model with selling price and stock sensitive demand under partial backlogging	66
67	Susceptability status of Aedes aegypti L. against different classes of insecticides in New Delhi, India to formulate mosquito control strategy in fields.	67
68	Effects of Achyranthes aspera extracts on the survival and midgut histo-architecture of Aedes aegypti L. early IV instars.	68
69	Growth regulatory and growth inhibitory effects of Thevetia neriifolia stem extracts on Helicoverpa armigera (Lepidoptera: Noctuidae).	69

160	Green synthesis of TiO2 nanosheet by chemical method for the removal of Rhodamine B from industrial waste	160
161	An overview of the factors affecting dengue transmission in Asian region and its predictive models.	161
162	Comparative larvicidal efficacy of α-cypermethrin alone and α-cypermethrin/Citrus sinensis peel extract binary mixtures against Aedes aegypti L.	162
163	Reduced physiological and reproductive fitness induced by Nerium oleander leaf extracts in the cotton bollworm, Helicoverpa armigera (Lepidoptera: Noctuidae).	163
164	Protection of surplus food from fungal spoilage using Streptomyces spp.: a green approach	164
165	Draft genome and secondary metabolite biosynthetic gene clusters of Streptomyces sp. strain 196.	165
166	Indicators for assessment of soil quality: a mini-review	166
167	Ibuprofen-based chemosensor for efficient binding and sensing of Cu2+ ion in aqueous medium	167
168	Fabrication of a Gold-Supported NiAlTi-LayeredDouble Hydroxide Nanocatalyst for Organic Transformations	168
169	Natural Polysaccharide Based Graphene Oxide Nanocomposites for Removal of Dyes from Wastewater: A Review	169
170	Self Nitrogen doped carbon Arogel drived from waste Cigarette buts (Cellulose acetate) for the adsorption of BPA : Kinetics and adsorption mechanism	170
171	Design and synthesis of various 5'-Deoxy-5'-(4-Substituted-1,2,3-Triazol-1- yl)-uridine analogues as inhibitors of Mycobacterium tuberculosis Mur ligases	171
172	Neem flowers (Azadirachta indica) as an abundant source of nectar for butterflies in an urban landscape in Delhi, India	172
173	A comprehensive checklist of butterflies seen in Corbett Tiger Reserve, Uttarakhand, India	173
174	Oviposition by Jamides bochus (Stoll, [1782]) (Insecta: Lepidoptera: Lycaenidae) in New Delhi, India	174
175	Diabetes: Perspective and challenges in modern era.	175
176	Vertical Motion of the Variable Infinitesimal Mass in the Cicular Sitnikov Problem	176
177	Generalized Elliptic Restricted Four-Body Problem with Variable Mass	177

232	Intensity quantification of public opinion and emotion analysis on climate change	232
233	A smart learning assistance tool for inclusive education	233
234	Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance.	234
235	Optimal ordering policy for deteriorating items with stock dependent demand, partial backlogging and trade credit period	235
236	A systematic review on the eco-safe management of mosquitoes with diflubenzuron: An effective growth regulatory agent	236
237	Indigenous plants demonstrating effective antioxidant properties	237
238	Formulation of Clitoriaternatea leaves-mediated silver nanoparticles to control Aedes aegypti larvae	238
239	In vitro and in silico anticancer potential analysis of Streptomyces sp. extract against human lung cancer cell line, A549	239
240	Sightings of the Tailless Llineblue, Prosotasdubiosa (Insecta: Lepidoptera: Lycaenidae) in Delhi, India	240
241	Sighting of Plain Tiger (Danaus chrysippus, Linn., 1758) form dorippus in New Delhi, India	241
242	Genera of ants associated with larvae of Plains Cupid (Chiladespandava,horsfield, 1829) Iinsecta: Lepidoptera: Lycaenidae) infesting Cycas, in Delhi, India, and an insight into the nature of their interaction	242
243	COVID-19 and cardiovascular disease: Clinical implications of biochemical pathways.	243
244	The Dynamical Study of Variable Mass Test Particle in Nonlinear Sense of Restricted 3-body Problem with Heterogeneous Primaries	244
245	Development of Dimethylisoxazole-Attached Imidazo [1, 2-a] pyridines as Potent and Selective CBP/P300 Inhibitors.	245
246	Ex vivo binding studies of the anti-cancer drug noscapine with human hemoglobin: a spectroscopic and molecular docking study.	246
247	Targeting unfolded protein response: a new horizon for disease control	247
248	Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices	248
249	Pressure Ionization, Polarizability and Screening Constants in Confined Hydrogen Like Ions of Astrophysical Importance	249
250	Encompassing environment synthesis, characterization and photovoltaic utilization of cadmium sulphide quantum dots	250

251	Reliable Time Slot Allocation Scheme among Mobile Nodes in MANET	251
252	Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population	252
253	Association of gender, age, and comorbidities with COVID-19 infection in India	253
254	Hesitancy and Acceptance of COVID-19 Vaccination Amidst the Second Wave of Pandemic in India: A General Population Study	254
255	Bioreducible polyethyleneimine core-shell nanostructures as efficient and non-toxic gene and drug delivery vectors.	255
256	Exploring the role of framework mutations in enabling breadth of a cross-reactive antibody (CR3022) against the SARS-CoV-2 RBD and its variants of concern.	256
257	Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites	257
258	A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions	258
259	A new polysaccharide-based ion-exchange resin for industrial wastewater treatment	259
260	Assessment of Groundwater Suitability for Drinking and Irrigation in Gurugram Block of Gurugram district, Haryana, India.	260
261	A DFT Study on Diels-Alder Reaction of Dibenzazepine and 2,5-Dimethylfuran Using Different Solvents and Temperature Conditions.	261
262	Chromone functionalized pyridine chemosensor for cupric ions detection.	262
263	Chromone derived effective probe for the detection of metal ion (Cu^{2+}) and chemical explosive (p-nitrotoluene).	263
264	Wet Chemical Growth of One Dimensional ZnO Film	264
265	An in-Silico investigation for acyclovir and its derivatives to fight the COVID-19: Molecular docking, DFT calculations, ADME and td-Molecular dynamics simulations,	265
266	II-VI core/shell quantum dots and doping with transition metal ions as a means of tuning the magnetoelectronic properties of CdS/ZnS core/shell QDs: A DFT study	266
267	Precisely engineered type II ZnO-CuS based heterostructure: A visible light driven photocatalyst for efficient mineralization of organic dyes	267

286	Unravelling impacts of C ion implantations at polar angles in the physical properties of ZnO nanostructured thin films	286
287	Spatiotemporal nonlinear evolution of the laser pulse and turbulence generation in laser produced plasmas.	287
288	Effect of Ag doping on structural, morphological and optical properties of CdO nanostructured thin films.	288
289	Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, Aedes aegypti L	289
290	Attractive sugar bait formulation for development of Attractive Toxic Sugar Bait for control of Aedes aegypti (Linnaeus).	290
291	Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in freshwater ciliate Euplotes aediculatus	291
292	Microbial Journey: Mount Everest to Mars	292
293	A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the Landfill and the Soil from the Human Inhabitant Land	293
294	The Role of Nanotechnology in Antiviral Regime: An Overview	294
295	Identification of perturbed pathways rendering susceptibility to tuberculosis in type 2 diabetes mellitus patients using BioNSi simulation of integrated networks of implicated human genes.	295
296	Pharmacological Manipulation of UPR: Potential Antiviral Strategy Against Chikungunya Virus.	296
297	Realizing the New Reality: Machine Learning Curbing Antimicrobial Resistance in Cutibacterium acnes.	297
298	Upsurge in biomedical waste due to COVID-19 in India: A statistical correlation, challenges and recommendations.	298
299	Evaluation of stigma receptivity and its properties in Helianthus annuus L. (Asteraceae).	299
300	Hydrotrope assisted green synthesis of dicoumarols and in silico and in vitro antibacterial, antioxidant and xanthine oxidase inhibition studies.	300
301	An understanding of coronavirus and exploring the molecular dynamics simulations to find promising candidates against the Mpro of nCoV to combat the COVID-19: A systematic review.	301
302	UHPLC Analysis of Polycyclic aromatic hydrocarbons (PAH) compounds from the soil by QuEChERS AOAC method from Manesar industrial area, Haryana.	302

303	Multicomponent synthetic strategies and perspectives for synthesis of linked or fused coumarin heterocycles.	303
304	Entropy for item inclination in sub-community based recommender system.	304
305	Evaluation of Cost benefit Analysis using One-R Supervised Machine Learning Algorithm for Healthcare, https://doi.org/10.14754/nq.2022.20.9.NQ44773	305
306	Mildly reduced graphene oxide membranes for water purification applications.	306
307	An Inclusive Science Laboratory for Visually Impaired Students.	307
308	Flexible inventory system of imperfect production under deterioration and inflation.	308
309	Perturbed Robe's problem with charged bodies.	309
310	Behaviour of a variable mass infinitesimal body in the CR3BP with heterogeneous primary and finite straight segment secondary.	310
311	Effects of Mass Variation in the Collinear Perturbed Moulton-Copenhagen Configuration.	311
312	The Implementation of the Pentagonal Fuzzy Number toward the Solution of the Fuzzy Inventory Model with Ramp Demand Function and Three Parameters Weibull Deterioration.	312
313	Optimal strategy for remanufacturing system of sustainable products with trade credit under uncertain scenario.	313
314	Space Dependent Study of Fast Neutron Spectra and Tritium Production Rate in a Fusion Reactor Blanket of Li_2O.	314
315	Effect of variation in glancing angle deposition on resistive switching property of WO3 thin films for RRAM devices.	315
316	Ensemble-based unsupervised machine learning method for membership determination of open clusters using Mahalanobis distance.	316
317	Two-photon Bound to Bound Transitions under Strong Screening Potential.	317
318	Theoretical analysis of relativistic energy corrections, partition function and thermodynamic properties of spherically confined hydrogen atom.	318
319	A novel RP-HPLC method for quantification of cholinesterase activity in human blood: An application for assessing organophosphate and carbamate insecticide exposure.	319

373	Bioacoustics or pitfall traps: Comparison of a modern and traditional method to estimate Ensifera richness	373

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3.3.1 Number of papers published per teacher in the Journals notified on UGC website during the last five years (5)

S.No.	Title of paper	Name of the author/s	Department of	Name of journal	Year of	ISSN number	Link to the recognition in UGC	Link to paper/ abstract of the article	Provide the link to Journal website	Indicate Journal's indexing
	a	b	c	d	e	f	g	h	i	j
1	**One-pot and catalyst-free synthesis of pyrroloquinolinediones and quinolinedicarboxylates**	Zhang, X., **Dhawan, G.**, Muthengi, A., Liu, S., Wang, W., Legris, M., & Zhang, W.	Biomedical Science	Green Chemistry	2017	1463-9262	https://doi.org/10.1039/C7GC01380A	https://pubs.rsc.org/en/content/articlelanding/2017/GC/C7GC01380A	https://mjl.clarivate.com:/search-results?issn=1463-9262&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
2	**A robust replenishment model for deteriorating items considering ramp-type demand and inflation under fuzzy environment**	Sharma, A., Sharma, U., & **Singh, C.**	Mathematics	International Journal of Logistics Systems	2017	17427967	https://doi.org/10.1504/IJLSM.2017.086944	https://www.inderscienceonline.com/doi/abs/10.1504/IJLSM.2017.086944	https://www.scopus.com/sourceid/4700151504	Indexed in UGC Care List and SCOPUS
3	**Supply chain model with two storage facility for stock dependent demand incorporating learning and inflationary effect under crisp and fuzzy environment.**	**Singh, C.**, & Singh, S. R.	Mathematics	International Journal of Fuzzy System Applicatio	2017	2156-177X	10.4018/IJFSA.2017040105	https://www.igi-global.com/gateway/article/179322#pnlRecommendationForm	https://www.scopus.com/sourceid/21100301444	Indexed in UGC Care List and SCOPUS
4	**Inhibition of gut proteases and development of dengue vector, Aedes aegypti by Allium sativum protease inhibitor**	Shamsi, T. N., Parveen, R., Ahmad, A., Samal, R. R., **Kumar, S.**, & Fatima, S.	Zoology	Acta Ecologica Sinica	2017	1872-2032	https://doi.org/10.1016/j.chnaes.2018.01.002	https://www.sciencedirect.com/science/article/abs/pii/S1872203217301695	https://mjl.clarivate.com/search-results?issn=1000-0933&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
5	**Assessment of Achyranthes aspera induced toxicity and molecular analysis of RAPD-PCR profiles of larval genomic DNA of Aedes aegypti L. (Diptera: Culicidae)**	**Sharma, A.**, Kumar, S., & Tripathi, P.	Zoology	Journal of Parasitic Diseases	2017	0971-7196	https://doi.org/10.1007/s12639-017-0935-1	https://link.springer.com/article/10.1007/s12639-017-0935-1	https://mjl.clarivate.com:/search-results?issn=0971-7196&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
6	**A facile and rapid method for green synthesis of Achyranthes aspera stem extract-mediated silver nanocomposites with cidal potential against Aedes aegypti L.**	Sharma, A., **Kumar, S.**, & Tripathi, P	Zoology	Saudi Journal of Biological Sciences	2017	1319-562X	https://doi.org/10.1016/j.sjbs.2017.11.001	https://www.sciencedirect.com/science/article/pii/S1319562X17302759	https://mjl.clarivate.com:/search-results?issn=1319-562X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
7	**Taxonomic and morphogenetic description of the freshwater ciliate Aponotohymena isoaustralis n. sp. (Ciliophora; Oxytrichidae) isolated from Sanjay lake, Delhi,**	Gupta, R., **Abraham, J.** S., Sripoorna, S., Toteja, R., Makhija, S., & El-Serehy, H.	Zoology	Acta Protozoologica	2017	0065-1583	10.4467/16890027AP.17.008.7483	https://www.proquest.com/openview/14a339a68fe019b3b23e8a868614850f/1?pq-origsite=gscholar&c	https://mjl.clarivate.com:/search-results?issn=0065-1583&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

8	**Diversity and abundance of ammonia-oxidizing bacteria and archaea in a freshwater recirculating aquaculture system**	**Khangembam, C. D.**, Sharma, J. G., & Chakrabarti, R.	Zoology	Hayati Journal of Biosciences,	2017	2053-9711	https://doi.org/10.1016/j.hjb.2017.11.003	https://www.sciencedirect.com/science/article/pii/S1978301917301596	https://mjl.clarivate.com:/search-results?issn=2053-9711&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
9	**Beyond the "Code": a guide to the description and documentation of biodiversity in ciliated protists (Alveolata, Ciliophora)**	Warren, A., Patterson, D. J., Dunthorn, M., Clamp, J. C., Achilles-Day, U. E. M.,	Zoology	Journal of eukaryotic Microbiology,	2017	1066-5234	https://doi.org/10.1111/jeu.12391	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12391	https://mjl.clarivate.com:/search-results?issn=1066-5234&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
10	**Assessment of heavy metal toxicity in four species of freshwater ciliates (Spirotrichea; Ciliophora) from Delhi, India**	**Abraham, J.** S., Sripoorna, S., Choudhary, A., Toteja, R., Gupta, R., Makhija, S., &	Zoology	Current Science	2017	0011-3891	https://www.jstor.org/stable/26494927 / https://www.ugc.ac.in/pdfnews/8919877	https://www.currentscience.ac.in/Volumes/113/11/2141.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
11	**Influence of copper and cadmium toxicity on the activity of an antioxidant enzyme, superoxide dismutase in freshwater ciliates**	Toteja, R., Makhija, S., Sripoorna, S., **Abraham**, J. S. & Gupta, R	Zoology	Indian Journal of Experimental Biology	2017	0019-5189	https://nopr.niscpr.res.in/handle/123456789/42844 / https://www.ugc.ac.in/pdfne	http://nopr.niscpr.res.in/bitstream/123456789/42844/1/IJEB%2055%2810%29%20694-701.pdf	https://mjl.clarivate.com:/search-results?issn=0019-5189&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
12	**Assessment of Particulate Matter (PM)concentrations at a typical construction site in Bangalore, India.**	Chowdhuri A and **Gupta C K**	Physics and Botany	International Research Journal of Environme	2017		https://doi.org/10.1016/j.snb.2016.07.040	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-177.php	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-177.php	**PEER REVIEWED**
13	**Distinct detection of liquor ammonia by ZnO/SAW sensor: study of complete sensing mechanism.**	**Raj V B,** Singh H, Nimal A T, Sharma MU, Tomar M and Gupta V	Physics	Sensors and Actuators B	2017	ISSN: 0020-0255	https://doi.org/10.1016/j.snb.2016.07.040	https://www.sciencedirect.com/science/article/pii/S0925400516310759	https://www.sciencedirect.com/science/article/pii/S0925400516310759	**SCOPUS INDEXED**
14	**Sensitivity Enhancement Studies of SAW vapor sensor by oscillator tuning using Varactor diode**	Singh H, Parmar Y, **Raj V B,** Pandya H M, Kumar J, Mishra M, Nimal A T and Sharma M U	Physics	IEEE Sensors	2017	ISSN:1530-437X	DOI: 10.1109/JSEN.2016.2647282	https://ieeexplore.ieee.org/document/7803545	https://ieeexplore.ieee.org/document/7803545/authors#authors	**SCOPUS INDEXED**

15	**Alterations in the reactive oxygen species in peripheral blood of chronic myeloid leukemia patients from Northern India**	**Jetly, S.,** Verma, N., Naidu, K., Faiq, M. A., Tulika, S., & Saluja, D.	Biomedical Science	Journal of clinical and diagnostic research	2017		doi: 10.7860/JCDR/2017/28565.10425	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5620896/	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5620896/	**SCOPUS INDEXED**
16	**An analysis upon various strategies for redesign and direct evolution of enzyme engineering**	Sharma, S. V., & **Hooda, S.**	Chemistry	Journal of Advances in Science and Technolog	2017	2230-9659	http://ignited.in/p/55520	http://ignited.in/p/55520	http://ignited.in/p/55520	**PEER REVIEWED**
17	**Comparative study of removal of Cu and Pb from aqueous solution by using modified rice husk ask as an adsorbent**	Kumar, R., **Arya, D. K.,** Singh, N., & Vats, H. K.	Chemistry	International Journal of Chemistry and	2017	2278-8719	https://www.researchgate.net/publication/334446847_Comparative_study_of_Removal_of_Cu_and_Pb_from_Aqueo	https://www.researchgate.net/publication/334446847_Comparative_study_of_Removal_of_Cu_and_Pb_from_Aqueo	https://www.researchgate.net/publication/334446847_Comparative_study_of_Re	**PEER REVIEWED**
18	**Developing a low cost activated carbon from agricultural waste for the removal of heavy metal from cotaminated waste**	Kumar, R., **Arya, D. K.,** Singh, N., & Vats, H. K.	Chemistry	International Journal of Applied Chemistry	2017	0973-1792	**https://www.ripublication.com/ijac17/ijacv13n3_06.pdf**	**https://www.ripublication.com/ijac17/ijacv13n3_06.pdf**	https://www.ripublication.com/ijac17/ijacv13n3_06.pdf	**PEER REVIEWED**
19	**Sportsmen's energy package Cordyceps sinensis: Medicinal importance and responsible phytochemical constituents**	Joshi, Y. C., Joshi, M. C., Chopra, V., Joshi, R. K., Sharma, R. Kant., & **Kumar, V**.	Chemistry	American Journal of Essential Oils and Natural	2017	2321-9114	**https://www.essencejournal.com/archives/2017/5/2/A/5-2-2**	**https://www.essencejournal.com/archives/2017/5/2/A/5-2-2**	https://www.essencejournal.com/archives/2017/5/2/A/5-2-2	**PEER REVIEWED**
20	**Online signature verification: A review**	Chaudhary, U., **Samal, C. K.,** & Kumar, V.	Computer Science	IOSR Journal of Computer Engineering	2017	2278-8727	UGC Journal No. 4899	https://www.researchgate.net/publication/303805873_Online_Signature_Verification_A_Review	https://www.researchgate.net/publication/303805873_Online_Signature_Verification_A_Review	**PEER REVIEWED**
21	**Comparative analysis on path planning algorithm's on mobile robot in image processing**	Choudhury, R. K., & **Samal, C. K.**	Computer Science	Journal of Advance Engineering and Research	2017	2348-4470	https://issuu.com/editorijaerd/docs/comparative_analysis_on_path_planni	https://issuu.com/editorijaerd/docs/comparative_analysis_on_path_planni	https://issuu.com/editorijaerd/docs/comparative_analysis_on_path_planni	**PEER REVIEWED**

22	**Impact of DDA optimization on mobile robot path planning for mixed image in image processing**	Choudhury, R. K., & **Samal, C. K.**	Computer Science	International Journal of Advanced Research	2017	0976-5697	https://doi.org/10.26483/ijarcs.v8i8.4624	o/index.php/ijarcs/art	http://ijarcs.info/index.php/Ijarcs/article/view/4624	**PEER REVIEWED**
23	**Target assignment in robotics and its distance optimality using DDA optimization in image processing**	Choudhury, R. K., & **Samal, C. K.**	Computer Science	International Journal of Science and Research	2017	2454-2008	https://ijsrm.humanjournals.com/wp-content/uploads/2017/10/4.Rama-	https://ijsrm.humanjournals.com/wp-content/uploads/2017/10/4.Rama-Kanta-Choudhury-Chandra-Kanta-	https://ijsrm.humanjournals.com/wp-content/uploads/2017/10/4.Rama-Kanta-	**PEER REVIEWED**
24	**Mobile robot path planning approach: A review**	Choudhury, R. K., Kumar, S., & **Samal, C. K.**	Computer Science	International Journal of Advanced Scientific	2017	2455-6378	UGC Journal No. 63502	**https://ijasrm.com/issues/volume-2-issue-8/**	https://ijasrm.com/issues/volume-2-issue-8/	**PEER REVIEWED**
25	**Architecture based on environmental monitoring system using zigbee wireless sensor networks**	**Samal, C. K.** & Choudhury, R. K.	Computer Science	Journal of Advanced Scientific Research and	2017	2455-6378	UGC Journal No. 63502	**https://ijasrm.com/issues/volume-2-issue-8/**	https://ijasrm.com/issues/volume-2-issue-8/	**PEER REVIEWED**
26	**Low power consumption in zigbee wireless networks: A, review**	**Samal, C. K.,** Choudhury, R. K., Kumar, V., & Mishra, S.	Computer Science	International Journal of Advance Engineerin	2017	2348-4470	UGC Journal No. 44839	https://issuu.com/editorijaerd/docs/low_power_consumption_in_zigbee_wir	https://issuu.com/editorijaerd/docs/low_power_consumption_in_zigbee_wir	**PEER REVIEWED**
27	**Society and Sex Work in *The Autobiography of a Sex Worker by* Nalini Jameela.**	**Garg, M. K.**	English	Language in India	2017	1930-2940	http://www.languageinindia.com/july2017/v17i7july2017.pdf	http://www.languageinindia.com/july2017/v17i7july2017.pdf	http://www.languageinindia.com/july2017/v17i7july2017.pdf	**PEER REVIEWED**
28	**The White Woman's Gaze**	**Rakshit, J. D.**	English	International Journal of English Language, Literature	2017	2321-7065	http://www.ijellh.com/the-white-womans-gaze	http://www.ijellh.com/the-white-womans-gaze	http://www.ijellh.com/the-white-womans-gaze	**PEER REVIEWED**
29	**Free and open source software: A key enabler for digital India**	Ranjan Kumar, Subhash Kumar, Sanjay K. Tiwari	Physics	South Asia Journal of Multidisciplinary Studies,	2017	0973-4562	https://pubs.aip.org/aip/pop/article-split/24/8/082111/212250/Nanosecond-	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	**PEER REVIEWED**

30	**Nanosecond Laser- Cluster Interactions at 109-1012 W/cm2**	**Rohtash Singh,** V. K. Tripathi, R. K. Vatsa, and D. Das	Physics	Phys. Plasmas 24, 082111	2017	1089-7674	https://doi.org/10.1063/1.4997452	https://pubs.aip.org/aip/pop/article-split/24/8/082111/212250/Nanosecond-laser-cluster-interactions-at-109-	https://pubs.aip.org/aip/pop/article-split/24/8/082111/212250/Nanosecond-laser-	**SCOPUS INDEXED**
31	**Pulse compression and self focusing of Gaussian laser pulses in plasma having relativistic ponderomotive nonlinearity**	S. Kumar, **P. K. Gupta,** R. K. Singh, S. Sharma, R. Uma and R. P. Sharma	Physics	Laser and particle beams 35, 429	2017	0263-0346	https://doi.org/10.1017/S0263034617000416	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/pulsecompression-and-selffocusing-of-	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/pulsecompre	**SCOPUS INDEXED**
32	**Detection of liquefied petroleum gas below lowest explosion limit (LEL) using nanostructured hexagonal strontium ferrite thin film**	M. Singh, B.C. Yadav, A. Ranjan, **Rakesh Kumar Sonker**, M. Kaur	Physics	Sens. Act. B: Chemi. 249, 96-104	2017	1872-6291	https://doi.org/10.1016/j.snb.2017.04.075	https://www.sciencedirect.com/science/article/abs/pii/S0925400517306755	https://www.sciencedirect.com/science/article/abs/pii/S0925400517306755?via%3Dihub	**SCOPUS INDEXED**
33	**Growth and characterization of sol-gel processed rectangular shaped nanostructured ferric oxide thin film followed by humidity and gas sensing**	B.C. Yadav, K. S. Chauhan, S. Singh, **Rakesh Kumar Sonker**, S. Sikarwar and R. Kumar	Physics	J. Mater. Sci: Mater Electron., 28 , 5270-5280	2017	0957-4522	DOI 10.1007/s10854-016-6184-8	https://link.springer.com/article/10.1007/s10854-016-6184-8	https://link.springer.com/article/10.1007/s10854-016-6184-8	**SCOPUS INDEXED**
34	**LPG detection using SnO_2, PANI-SnO_2 and Ag-SnO_2 composite film fabricated by Chemical route**	**Rakesh Kumar Sonker,** S.R. Sabhajeet, B.C. Yadav, Rahul Johari	Physics	Int. J. Electroactive Mater. 5, 6-12	2017	1936-7317	http://dx.doi.org/10.1166/asl.2014.5476	https://www.electroactmater.com/download.php?pdf=5-1-6-12.pdf	https://www.electroactmater.com/download.php?pdf=5-1-6-12.pdfhttps://www.ingentaconne	**PEER REVIEWED**
35	**Preparation of PANI doped TiO_2 nanocomposite thin film and its relevance as room temperature liquefied petroleum gas sensor**	**Rakesh Kumar Sonker,** S.R. Sabhajeet, B. C. Yadav	Physics	J. Mater. Sci: Mater Electron., 28, 14471–14	2017	0957-4522	DOI 10.1007/s10854-017-7309-4	https://link.springer.com/article/10.1007/s10854-017-7309-4	https://link.springer.com/article/10.1007/s10854-017-7309-4	**SCOPUS INDEXED**
36	**Development of Fe_2O_3-PANI nanocomposite thin film based sensor for NO_2 detection**	**Rakesh Kumar Sonker,** B. C. Yadav	Physics	J. Taiwan Ins. of Chemical Eng., 77, 276-281	2017	1872-6291	https://doi.org/10.1016/j.jtice.2017.04.042	https://www.sciencedirect.com/science/article/abs/pii/S1876107017302262	https://www.sciencedirect.com/science/article/abs/pii/S1876107017302262	**SCOPUS INDEXED**
37	**Self-compression of two co-propagating laser pulse having relativistic nonlinearity in plasma**	S. Kumar, **P. K. Gupta,** R. K. Singh, S. Sharma, R. Uma and R. P. Sharma	Physics	Laser and particle beams 35,	2017	0263-0346	https://doi.org/10.1017/S0263034617000787	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/selfcompression-of-two-copropagating-	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/selfcompress	**SCOPUS INDEXED**

38	**Partially synchronized states in an ensemble of chemo-mechanical oscillators**	**P Kumar,** DK Verma, P Parmananda	Physics	Physics letters A	2017	0020-0255	https://doi.org/10.1016/j.physleta.2017.05.032	https://www.sciencedirect.com/science/article/pii/S0375960116311896	https://www.sciencedirect.com/science/article/pii/S0375960116311896	**SCOPUS INDEXED**
39	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	**Kumar, S.,** Warikoo, R., Mishra, M., Samal, R. R., Rana, S., Panmei, K., Dagar, V. S., & Sharma, A.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-thesurvival-and-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
40	***Pseudomonas aeruginosa:* Isolation, characterization and evaluation of larvicidal efficacy against *Aedes aegypti* L.**	Shukla, R. K., **Kumar, S.,** & Tripathi, P.	Zoology	European *Journal of Biomedical and Pharmace*	2017	2349-8870	https://www.ejbps.com/ejbps/abstract_id/3088	https://www.ejbps.com/ejbps/abstract_id/3088	https://www.ejbps.com/ejbps/abstract_id/3088	**PEER REVIEWED**
41	**Bioprospecting xylanase enzymes from diverse ecological habitats**	Das, P., Kumar, P., Kumar M., Solanki, R., & **Kapur, M. K**.	Zoology	International Research Journal of Natural	2017	2349-4077	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZYMES_FROM_DIVERS	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZYMES_FROM_DIVERS	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZY	**PEER REVIEWED**
42	**Purification and molecular characterization of chitinases from soil actinomycetes**	Das, P., Kumar, P., Kumar, M., Solanki, R., & **Kapur, M. K.**	Zoology	African Journal of Microbiology Research	2017	1996-0808	http://dx.doi.org/10.5897/AJMR2017.8612	https://www.researchgate.net/journal/African-Journal-of-Microbiology-Research-1996-0808	https://www.researchgate.net/journal/African-Journal-of-Microbiology-Research-1996-	**PEER REVIEWED**
43	**Crystal structure of UDP-N-acetylglucosamine-enolpyruvate reductase (MurB) from Mycobacterium tuberculosis**	Eniyan, K., Dharavath, S., Vijayan, R., **Bajpai, U**., & Gourinath, S	Biomedical Science	Biochimicaet Biophysica Acta (BBA)-Proteins	2018	15709639	https://doi.org/10.1016/j.bbapap.2017.11.013	https://www.sciencedirect.com/science/article/abs/pii/S1570963917302819?via%3Dihub	https://mjl.clarivate.com:/search-results?issn=1570-9639&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
44	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.,** Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S., Shah, A., Arora, D.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
45	**Microwave assisted synthesis of spiro heterocyclic systems: A review**	**Khanna, P.,** Khanna, L., Thomas, S. J., Asiri, A. M., & Panda, S. S.	Chemistry	Current organic chemistry	2018	1385-2728	10.2174/1385272821666170818161517	https://www.eurekaselect.com/article/85367	https://mjl.clarivate.com:/search-results?issn=1385-2728&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

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47	**Controlling room temperature ferromagnetism and band gap in ZnO nanostructured thin films by varying angle of implantation**	Hariwal, V, R., Malik, H. K., **Negi, A.**, & Kandasami, A	Physics	RSC Advances	2018	2046-2069	https://doi.org/10.1039/C7RA10615G	https://pubs.rsc.org/en/content/articlelanding/2018/RA/C7RA10615G	https://mjl.clarivate.com:/search-results?issn=2046-2069&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
48	**Emamectin Benzoate: Potential larvicide and antifeedant agent against cotton boll worm Helicoverpa armigera (Lepidoptera: Noctuidae)**	Dagar, V. S., & **Kumar, S.**	Zoology	Journal of Applied and Natural Sciences	2018	2231-5209	https://doi.org/10.31018/jans.v10i2.1738	https://journals.ansfoundation.org/index.php/jans/article/view/1738	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
49	**Sld5 Ensures centrosomal resistance to congression forces by preserving centriolar satellites.**	Kaur, M., Devi, R., Ghosh, T., Khan, M. M., Kumar, P., Kar, P. A., **Sharma, A.**, Varshney, A.,	Zoology	Molecular and Cellular Biology,	2018	0270-7306	https://doi.org/10.1128/MCB.00371-17	https://journals.asm.org/doi/10.1128/MCB.00371-17	https://mjl.clarivate.com:/search-results?issn=0270-7306&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
50	**The study of effect of various temperatures on the abundance of ammonia oxidizing archaea and bacteria.**	**Khangembam, C. D.**, Singh, S. P., Sharma, J. G., & Chakrabarti, R.	Zoology	The Indian Journal of Animal Science	2018	0367-8318	10.56093/ijans.v88i5.80023	https://www.researchgate.net/profile/Rina-Chakrabarti/publication/325626070_Study_of_effect_of_v	https://mjl.clarivate.com:/search-results?issn=0367-8318&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
51	**Estimating the parameter of selected uniform population under the squared log error loss function**	**Meena, K.R.,** Mohd Arshad, & Gangopadhyay, A. K.	Mathematics	Communications in Statistics-Theory and	2018	1532-415X	https://doi.org/10.1080/03610926.2017.1324986	https://www.tandfonline.com/doi/abs/10.1080/03610926.2017.1324986?journalCode=lsta20	https://mjl.clarivate.com/search-results?issn=0361-0926&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
52	**Cellular and molecular basis of heavy metal induced stress in ciliates: A review**	Sripoorna, S., Abraham, J. S., Maurya, S.**, Makhija, S.**, Gupta, R., & Toteja, R.	Zoology	Current Science	2018	0011-3891	https://www.jstor.org/stable/26494927 / https://www.ugc.ac.in/pdfnews/8919877	https://www.currentscience.ac.in/Volumes/114/09/1858.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
53	**Floral contrivances and specialised pollination mechanism strongly influence mixed mating in Wrightia tomentosa (Apocynaceae).**	Barman, C., **Singh, V.K.**, Das, S. & Tandon, R.	Botany	Plant Biology	2018	Online ISSN: 1438-8677	i.org/10.1111/p	https://onlinelibrary.wiley.com/doi/10.1111/plb.12690	https://mjl.clarivate.com/search-results?issn=1435-8603&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

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55	**Heteroleptic metal(II) complexes of curcumin and 2,2'-bipyridine: Synthesis, characterization, molecular modeling and preliminary antimicrobial**	Lal S., Joshi M. C., **Hooda,S.** & Kumar,V.	Chemistry	Rev. Roum. Chim.	2018	ISSN: 0035-3930	-content/uploa	https://revroum.lew.ro/wp-content/uploads/2018/04/Art%2006.pdf	https://www.scopus.com/sourceid/21508	Indexed in UGC Care List, SCOPUS and Web of Science
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57	**A highly selective sensor Cu2+ and Fe3+ ions in aqueous medium: Spectroscopic, computational and cell imaging studies.**	**Lal S.**, Kumar S., Hooda, S. & Kumar P.	Chemistry	Journal of Photochemistry and Photobiology A:	2018	1010-6030	.1016/j.jphotoch	https://www.sciencedirect.com/science/article/abs/pii/S1010603018305501	https://www.scopus.com/sourceid/26966	Indexed in UGC Care List and SCOPUS
58	**Protective effects of Aporosa octandra bark extract against D-galactose induced cognitive impairment and oxidative stress in mice.**	Panda S.S., Girgis A-S., Prakash A., Khanna L., **Khanna, P.**, Shalaby El-S. M., Fawzy N.G. & Jain S.	Chemistry	Heliyon	2018	2405-8440(Online)	.0.1016/j.heliyo	https://www.cell.com/heliyon/fulltext/S2405-8440(18)34864-3?_returnURL=https%3A%2F%2Flinki	https://www.scopus.com/sourceid/21100411756	Indexed in UGC Care List, SCOPUS and Web of Science
59	**Social Centrality using network hierarchy and community structure.**	Saxena R., **Kaur, S.**, Bhatnagar V.	Computer Science	Data Mining and Knowledge	2018	1384-5810	/10.1007/s1061	https://link.springer.com/article/10.1007/s10618-018-0582-x#:~:text=Social%20centrality%20score%20of%20a,of%2	https://mjl.clarivate.com:/search-results?issn=1384-5810&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
60	**Bandwidth Efficient Broadcast Protocols in MANETs: A Review**	**Samal, C. K.** , Choudhury R. K.	Computer Science	International Journal of Computer Sciences	2018	2347-2693	.26438/ijcse/v6	https://www.ijcseonline.org/pdf_paper_view.php?paper_id=1632&8-IJCSE-02736.pdf	UGC Listed Journal 2019, Journal No:63193 https://www.ijcseonline.org/	Indexed in UGC Care List, SCOPUS and Web of Science
61	**Structural and optical properties of electrochemically deposited ZnOnanorods by using graphene oxide and ITO as substrate material: A comparative study**	Chetna, Kumar, S., **Garg, A.,** Chowdhuri, A., Jain, A., & Kapoor, A.	Electronics, Physics	Materials Research Express	2018	2053-1591	.088/2053-1591	https://iopscience.iop.org/article/10.1088/2053-1591/aad7a5	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

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63	**Sonication Effect on Graphene Oxide (GO) Membranes for Water Purification Applications"**	Kumar, S., **Garg, A.**, & Chowdhuri, A.	Electronics, Physics	Materials Research Express	2019	2053-1591	DOI 10.1088/2053-1591/ab1ffd	https://iopscience.iop.org/article/10.1088/2053-1591/ab1ffd#:~:text=It%20is%20noted%20that%20sonica	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
64	**Circular restricted three-body problem when both the primaries are heterogeneous spheroid of three layers and infinitesimal body varies its mass**	Ansari, A. A., Alhussain, Z. A., & **Prasad, S. N.**	Mathematics	Journal of Astrophysics and Astronomy	2018	0973-7758	https://doi.org/10.1007/s12036-018-9540-7	https://link.springer.com/article/10.1007/s12036-018-9540-7	https://mjl.clarivate.com/search-results?issn=0250-6335&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
65	**An EOQ Model for Deteriorating Items with Selling Price Dependent Exponential Demand for Time Varying Holding and Deterioration Costs**	Verma, S. K., Mohd. Rizwanullah, & **Singh, C.**	Mathematics	International Journal of Engineering &	2018	2227-524X	/10.14419/ijet.v	https://www.sciencepubco.com/index.php/ijet/article/view/24294	https://www.scopus.com/sourceid/21100805731	Indexed in SCOPUS
66	**A production inventory model with selling price and stock sensitive demand under partial backlogging**	**Aarya, D. D.** & Kumar, M.	Mathematics	International Journal of Mathematics in	2018	1757-5850	10.1504/IJMOR	https://www.inderscienceonline.com/doi/abs/10.1504/IJMOR.2018.090802	https://www.scopus.com/sourceid/21100202502	Indexed in UGC-Care List and SCOPUS
67	**Susceptability status of Aedes aegypti L. against different classes of insecticides in New Delhi, India to formulate mosquito control strategy in fields.**	**Samal, R. R.** & Kumar, S.	Zoology	Open Parasitology Journal	2018	1874-4214	74/1874421401	https://openparasitologyjournal.com/VOLUME/6/PAGE/52/ABSTRACT/	https://www.scopus.com/sourceid/21100205964	Indexed in SCOPUS
68	**Effects of Achyranthes aspera extracts on the survival and midgut histo-architecture of Aedes aegypti L. early IV instars.**	Sharma, A., **Kumar, S.,** & Tripathi, P.	Zoology	Open Parasitology Journal	2018	1874-4215	74/1874421401	https://openparasitologyjournal.com/VOLUME/6/PAGE/41/FULLTEXT/	https://www.scopus.com/sourceid/21100205964	Indexed in SCOPUS
69	**Growth regulatory and growth inhibitory effects of Thevetia neriifolia stem extracts on Helicoverpa armigera (Lepidoptera: Noctuidae).**	Mishra, M., Gupta, K.K., & **Kumar, S.**	Zoology	Archives of Phytopathology and Plant	2018	0323-5408	https://doi.org/10.1080/03235408.2018.1521324	https://www.tandfonline.com/doi/abs/10.1080/03235408.2018.1521324?journalCode=gapp20	https://mjl.clarivate.com:/search-results?issn=0323-5408&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

70	**Modelling of Pinning-Depinning Reversal Mechanism in Ion-Irradiated Co/Al2O3 Thin Films.**	Goyal, R., Gupta, R., **Negi, A.,** Asokan, K., Kanjilal, D., Lamba, S., & Annapoorni, S.	Physics	Physica Status Solidi (A) Applications And	2018	1862-6300	g/10.1002/pssa	https://onlinelibrary.wiley.com/doi/10.1002/pssa.201800141	https://mjl.clarivate.com/search-results?issn=1862-6300&hide_exact_match_fl=true	Indexed in UGC Care List, SCOPUS and Web of Science
71	**Polarization dependent charge control model for microwave performance assessment of AlGaN/GaN/AlGaN double heterostructure HEMTs**	Chugh, N., **Bhattacharya, M.**, Kumar, M., Deswal, S. S., & Gupta, R. S.	Electronics	Journal of Computational Electronics	2018	1569-8025	https://doi.org/10.1007/s10825-018-1190-0	https://link.springer.com/article/10.1007/s10825-018-1190-0	https://mjl.clarivate.com/search-results?issn=1569-8025&hide_exact_match_fl=true	Indexed in UGC Care List, SCOPUS and Web of Science
72	**Larvicidal activities of petroleum ether extracts of different fruit peel wastes against an Indian strain of filarial vector, *Culex quinquefasciatus* Say (Diptera:**	**Shrankhla,** & Kumar, S**.**	Zoology	European Journal of Biomedical and Pharmace	2018	2349-8870	https://www.ejbps.com/ejbps/abstract_id/3948	https://www.ejbps.com/ejbps/abstract_id/3948	https://www.ejbps.com/ejbps/abstract_id/3948	**PEER REVIEWED**
73	**Role of gold and silver nanoparticles in cancer nano-medicine**	Chugh, H., Sood, D., Chandra, I., Tomar, V., **Dhawan G**.& Chandra, R.	Biomedical Science	Artificial Cells, Nanomedicine, and Biotechnol	2018	1210-1220	0/21691401.20	https://pubmed.ncbi.nlm.nih.gov/29533101/	https://pubmed.ncbi.nlm.nih.gov/29533101/	**SCOPUS INDEXED**
74	**Gauging the nature and magnitude of Particulate Matter (PM) concentrations in Bengaluru, the IT capital of India**	**Gupta, *C. K;*** Singh, J. P; Chopra, P; Raj, V. B; Chowdhuri, A.	Botany, Physics, Physics	DU Journal of Undergraduate Research	2018	2395 - 2334	https://journals.du.ac.in/ugresearch/vol3_2.html	https://journals.du.ac.in/ugresearch/	https://journals.du.ac.in/ugresearch/vol3_2.html	**PEER REVIEWED**
75	**A concise synthesis of 2-ALKENYL-3-phenyl-4H-chromen-4-ones via novel C-C bond formation using sulfone as potential intermediate**	Khanna, L., **Khanna, P**. and Jain, S.C.	Chemistry	Ind. J. Chem	2018	2583-1321	https://www.researchgate.net/publication/326693392_A_concise_synthesis_of_2-	https://www.researchgate.net/publication/326693392_A_concise_synthesis_of_2-4H-chromen-4-	https://www.researchgate.net/publication/326693392_A_concise_synthesis_of_2-alkenyl-3-phenyl	**SCOPUS INDEXED**
76	**Geometry of the Large Magellanic Cloud using multiwavelength photometry of classical Cepheids**	Sukanta Deb, Chow-Choong Ngeow, Shashi M Kanbur, Harinder P Singh, Daniel Wysocki,	Physics	Monthly Notices of the Royal Astronomical Society	2018	2526–2540	https://doi.org/10.1093/mnras/sty1124	https://academic.oup.com/mnras/article/478/2/2526/4992330	https://academic.oup.com/mnras/article/478/2/2526/4992330	**SCOPUS INDEXED**
77	**Adoption of Free and Open Source Software in India,**	Ranjan Kumar, **Subhash Kumar,** Sanjay K. Tiwari	Physics	International Journal of Applied Engineering Research	2018	0973-4562	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	**PEER REVIEWED**

78	**Spherical growth of nanostructures ZnO based optical sensing and photovoltaic application**	**Rakesh Kumar Sonker**, S. Sikarwar, S.R. Sabhajeet, Rahul, B.C. Yadav	Physics	Optical Materials, 83, 342-347	2018	1872-6291	https://doi.org/10.1016/j.optmat.2018.06.046	https://www.sciencedirect.com/science/article/abs/pii/S0925346718304269	https://www.sciencedirect.com/science/article/abs/pii/S0925346718304269	**SCOPUS INDEXED**
79	**Study of electrical, dielectric and EMI shielding behavior of copper metal, copper ferrite and PVDF composite**	K.K. Halder, **Rakesh Kumar Sonker**, V.K. Sachdev, Monika Tomar, Vinay Gupta	Physics	Integrated Ferroelectrics, 194 (2018) 78-85	2018	1067-8489	https://doi.org/10.1080/10584587.2018.1514879	https://www.tandfonline.com/doi/abs/10.1080/10584587.2018.1514879	https://www.tandfonline.com/doi/abs/10.1080/10584587.2018.1514879	**SCOPUS INDEXED**
80	**Zn-Doped TiO_2 Nanoparticles Employed as Room Temperature Liquefied Petroleum Gas Sensor**	S.R. Sabhajeet, **Rakesh Kumar Sonker**, B.C. Yadav	Physics	Advanced Science, Engineering and Medicine,	2018	2164-6635	https://doi.org/10.1166/asem.2018.2249	https://www.ingentaconnect.com/content/asp/asem/2018/00000010/f0020007/art00020;jsessionid=1uc7qi3kxqwwy.x-	https://www.ingentaconnect.com/content/asp/asem/2018/00000010/f0020007/art00020;jsessioni	**PEER REVIEWED**
81	**Synthesis and investigation of cubical shaped barium titanate and its application as opto-electronic humidity sensor**	S. Sikarwar, **Rakesh Kumar Sonker**, A. Shukla, B.C. Yadav	Physics	J. Mater. Sci: Mater Electron., 29, 12951-12958	2018	2193-1801	https://doi.org/10.1007/s10854-018-9415-3	https://link.springer.com/article/10.1007/s10854-018-9415-3	https://link.springer.com/article/10.1007/s10854-018-9415-3	**SCOPUS INDEXED**
82	**Less toxic tin incorporated perovskite solar cell using polymer electrolyte processed in the air**	Rahul, P.K. Singh, M. Parvaz, S. Ahmed, **Rakesh Kumar Sonker**, B. Bhattacharya	Physics	Optik, 169, 166-171	2018	1872-6291	https://doi.org/10.1016/j.ijleo.2018.05.064	https://www.sciencedirect.com/science/article/pii/S0030402618307137	https://www.sciencedirect.com/science/article/pii/S0030402618307137	**SCOPUS INDEXED**
83	**Sol-gel formed spherical nanostructured titania based liquefied petroleum gas sensor**	S. Sabhajeet, B. Yadav, **Rakesh Kumar Sonker**	Physics	AIP Conference Proceedings, 1953,	2018	1551-7616	https://doi.org/10.1063/1.5032413	https://pubs.aip.org/aip/acp/article-abstract/1953/1/030078/857970/Sol-gel-formed-spherical-	https://pubs.aip.org/aip/acp/article-abstract/1953/1/030078/857970/Sol-gel-formed-	**SCOPUS INDEXED**
84	**ZnO nanoneedle structure based dye-sensitized solar cell utilizing solid polymer electrolyte**	**Rakesh Kumar Sonker**, Rahul, S.R. Sabhajeet	Physics	Materials Letters, 223. 133-136	2018	1872-6291	https://doi.org/10.1016/j.matlet.2018.03.199	https://www.sciencedirect.com/science/article/pii/S0167577X18305809	https://www.sciencedirect.com/science/article/pii/S0167577X18305809	**SCOPUS INDEXED**
85	**Enhancement in self-compression due to co-propagating laser pulse in plasma**	S. Kumar, **P. K. Gupta**, R. Uma and R. P. Sharma	Physics	Optics Communications	2018	1872-6291	https://doi.org/10.1016/j.optcom.2018.06.023	https://www.sciencedirect.com/science/article/pii/S0030401818305145?via%3Dihub	https://www.sciencedirect.com/science/article/pii/S0030401818305145?via%3Dihub	**SCOPUS INDEXED**

86	**Dynamics of focused femtosecond Laser Pulse during photodisruption of crystalline lens**	**P. K. Gupta**, R. K. Singh and R. P. Sharma	Physics	Physics of Plasmas	2018	1089-7674	i.org/10.1063/1	https://pubs.aip.org/aip/pop/article/25/4/043121/904528/Dynamics-of-focused-femtosecond-laser-pulse-during	https://pubs.aip.org/aip/pop/article/25/4/043121/904528/Dynamics-of-focused-femtosecond-	**SCOPUS INDEXED**
87	**Potential of Nardostachys jatamansi extracts to manage Indian strain of Aedes aegypti: A novel approach for vector control.**	Kumar, S., **Sharma, A.** & Warikoo, R.	Zoology	Vector Biology Journal	2018	2473-4810	10.4172/2473-4810.1000129	https://www.scitechnol.com/peer-review/potential-of-nardostachys-jatamansi-extracts-to-manage-indian-	nil	**PEER REVIEWED**
88	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**
89	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R; Kumar, V; Uberoi, V;	Chemistry	International Journal of Advanced Education	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-324.pdf	nil	**PEER REVIEWED**
90	**Structure- guided Design and Development of Potent and Selective Dual Bromodomain 4 (BRD4)/Polo-like Kinase 1 (PLK1) Inhibitors**	Liu, S.; Yosief, H. O.; Dai, L.; Huang, H.; **Dhawan, G.;** Zhang, X.; Muthengi, A. M.; Roberts, J.; Buckley,	Biomedical Science	Journal of Medicinal Chemistry	2018	0022-2623	https://doi.org/10.1021/acs.jmedchem.8b00765	https://pubs.acs.org/doi/10.1021/acs.jmedchem.8b00765	https://mjl.clarivate.com:/search-results?issn=0022-2623&hide_exact_match_fl=tru	**SCOPUS INDEXED**
91	**Sequential [3+2] cycloaddition and [5+N] annulation reactions for modular synthesis of dihydrobenzoxazines, tetrahydrobenzoxazepines and**	Muthengi, A.; Zhang, X.; **Dhawan, G.**; Zhang, W.; Corsini, F.; Zhang, W.	Biomedical Science	Green Chemistry	2018	1463-9270	https://doi.org/10.1039/C8GC01099D	https://pubs.rsc.org/en/content/articlelanding/2018/gc/c8gc01099d	https://mjl.clarivate.com:/search-results?issn=1463-9262&hide_exact_match_fl=tru	**SCOPUS INDEXED**
92	**An Analysis on Recent Technological Developments in Green Chemistry: Biocatalytic Processes**	Sharma, S. P. & **Hooda, S.**	Chemistry	Journal of Advances and Scholarly Researche	2018	2230-7540	http://ipublisher.in/l/a/58228	http://ipublisher.in/l/a/58228	nil	**PEER REVIEWED**
93	**Sighting of Jamides bochus (Stoll, 1782) and Prosotas Nora (C. Felder 1860) (Insecta: Lepidoptera: Lycaenidae) From Urbanized Parts Of New Delhi, India.**	**Chaudhary, R.** & **Kumar, V.**	Biomedical Science	Bionotes	2019	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://www.andcollege.du.ac.in/uploads/voiceofandc/BIONOTES.pdf	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science

94	**Occurrence of subdioecy and scarcity of gender-specific markers reveal an ongoing transition to dioecy in Himalayan seabuckthorn (Hippophae rhamnoides ssp.**	**Mangla, Y.**, Das K, Bali S, Ambreen H, Raina SN, Tandon R, & Goel S.	Botany	Heredity	2019	0018067X	https://doi.org/10.1038/s41437-018-0084-z	https://www.nature.com/articles/s41437-018-0084-z	https://www.scopus.com/sourceid/22235	Indexed in UGC Care List, SCOPUS and Web of Science
95	**Synchronization of fractional oder Rabinovich-Fabrikant systems using sliding mode control techniques**	Kumar, S., **Singh, C., Prasad**, **S. N.**, Shekhar, C., & Agarwal, R.	Mathematics	Archives of Control Sciences	2019	2300-2611	DOI:10.24425/acs.2019.129384	https://journals.pan.pl/dlibra/publication/129384/edition/112924/content	https://mjl.clarivate.com/search-results?issn=2300-2611&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
96	**An Optimal Policy for Deterministic Model for Time Proportional Deteriorated Inventory with Different Demand Rate Pattern**	Verma, S. K., Mohd. Rizwanullah, **& Singh, C.**	Mathematics	Journal of Advanced Research in Dynamical	2019	1943-023X	DOI:10.13140/RG.2.2.25300.55682	https://www.jardcs.org/abstract.php?id=238#	https://www.scopus.com/sourceid/20500195215	Indexed in SCOPUS
97	**Influence of open educational resources on educational practices in the Global South**	**Kumar, S.**	Zoology	Nature Human Behaviour	2019	2397-3374	https://doi.org/10.1038/s41562-019-0624-4	https://www.nature.com/articles/s41562-019-0624-4	https://mjl.clarivate.com/search-results?issn=2397-3374&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
98	**Diminished Activity of Larval Midgut Transaminases and Phosphatases in Helicoverpa armigera Hübner (Lepidoptera) Induced by Dietary Stem Extracts**	**Mishra, M.,** Gupta, K.K., & Kumar, S.	Zoology	Journal of the Lepidopterist's Society	2019	0024-0966	https://doi.org/10.18473/lepi.73i1.a4	https://bioone.org/journals/the-journal-of-the-lepidopterists-society/volume-73/issue-1/lepi.73i1.a4/Dimin	https://mjl.clarivate.com:/search-results?issn=0024-0966&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
99	**Draft genome of Streptomyces sp.strain 130 and functional analysis of extracellular enzyme producing genes.**	Kumar, M., Kumar, P., **Das, P.,** & Kapur, M.K.	Zoology	Molecular Biology Reports	2019	1573-4978	https://doi.org/10.1007/s11033-019-04960-y	https://link.springer.com/article/10.1007/s11033-019-04960-y	https://www.scopus.com/sourceid/14154	Indexed in SCOPUS
100	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as sensitive bio-indicators for soil**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A., Yadav, K., Singh, S.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X1930066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
101	**Techniques and tools for species identification in ciliates: A review.**	**Abraham, J.S.,** Sripoorna, S., Maurya, S., Makhija, S., Gupta, R., & Toteja, R.	Zoology	International Journal of Systematic and	2019	1466-5026	https://doi.org/10.1099/ijsem.0.003176	https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijsem.0.003176	https://mjl.clarivate.com/search-results?issn=1466-5026&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

102	**Ferroelectric liquid crystal nanocomposites: Recent development and future perspective.**	**Yadav, S. P.**, Yadav, K., Lahiri, J. & Parmar, A. S.	Physics	Liquid Crystal Reviews	2019	2168-0418	https://doi.org/10.1080/21680396.2019.1589400	https://www.tandfonline.com/doi/full/10.1080/21680396.2019.1589400	https://mjl.clarivate.com/search-results?issn=2168-0396&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
103	**A Novel Method of Electrochemically Growing ZnO Nanorods on Graphene Oxide as Substrate for Gas Sensing Applications".**	Chetna, Kumar, S., **Garg, A.,** Chowdhuri, A., Jain, A. & Kapoor, A.	Physics, Electronics	Material Research Express	2019	2053 -1591	DOI 10.1088/2053-1591/ab16f8	https://iopscience.iop.org/article/10.1088/2053-1591/ab16f8#:~:text=The%20potential%20of%20electroc	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
104	**Transient setting of relativistic ponderomotive non-linearity and filamentation of ultra-short laser pulses in collisionless plasmas**	Sharma, R.P., Kumar, N., Uma, R., Singh, R.K., & **Gupta, P.K.**	Physics	Laser and Particle beams	2019	0263-0346	https://doi.org/10.1017/S0263034619000454	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/transient-setting-of-relativistic-	https://mjl.clarivate.com/search-results?issn=0263-0346&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
105	**Exploitation of potential bioactive compounds from two soil derived actinomycetes, Streptomyces sp. strain 196 and RI.24**	Kumar, P., Kundu, A., Kumar, M., Solanki, R., & **Kapur, M.K.**	Zoology	Microbiological Research	2019	0944-5013	https://doi.org/10.1016/j.micres.2019.126312	https://www.sciencedirect.com/science/article/pii/S0944501319304884?via%3Dihub	https://www.scopus.com/sourceid/20267	Indexed in UGC Care List, SCOPUS and Web of Science
106	**Expression and molecular characterizationof stress-responsive genes (hsp70 and Mn-sod) and evaluation of antioxidant enzymes (CAT and GPx) in heavy**	Somasundaram, S., Abraham, J.S., Maurya, S., **Toteja, R.**, Gupta, R., & Makhija, S.	Zoology	Molecular Biology Reports	2019	0301-4851	https://doi.org/10.1007/s11033-019-04942-0	https://link.springer.com/article/10.1007/s11033-019-04942-0	https://mjl.clarivate.com/search-results?issn=0301-4851&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
107	**Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018**	Kamra, K., Kaur, H., Abraham, J.S., Somasundaram, S., **Makhija, S.**, Toteja, R., Warren, A., &	Zoology	Journal of Eukaryotic Microbiology	2019	1066-5234	https://doi.org/10.1111/jeu.12773	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12773	https://mjl.clarivate.com/search-results?issn=1066-5234&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
108	**Synthesis, DFT studies, molecular docking, antimicrobial screening and UV fluorescence studies on ct-DNA for novel Schiff bases of 2-(1-aminobenzyl) benzimidazole**	Singhal, S., **Khanna, P** & Khanna, L.	Chemistry	Heliyon	2019	5-8440(On	https://doi.org/10.1016/j.heliyon.2019.e02596	https://www.sciencedirect.com/science/article/pii/S2405844019362565	https://www.scopus.com/sourceid/21100411756	Indexed in UGC Care List, SCOPUS and Web of Science
109	**Recent Trends in the Synthesis of Benzimidazoles From o-Phenylenediamine via Nanoparticles and Green Strategies Using Transition Metal Catalysts**	Singhal, S., **Khanna, P.,** Panda, S. S., & Khanna, L.	Chemistry	Journal Of Heterocyclic Chemistry	2019	3-5193 (On	https://doi.org/10.1002/jhet.3649	https://onlinelibrary.wiley.com/doi/abs/10.1002/jhet.3649	https://www.scopus.com/sourceid/25882	Indexed in UGC Care List, SCOPUS and Web of Science

110	**Curcumin based supramolecular ensemble for optical detection of Cu2+ and Hg2+ ions**	Lal, S., Prakash, K., Khera, N., Drashya, Singh, S., Singh, A., **Hooda, S.,** & Chandra, R.	Chemistry	Journal of Molecular Structure	2019	0022-2860	https://doi.org/10.1016/j.molstruc.2020.128091	https://www.sciencedirect.com/science/article/abs/pii/S0022286020304166#:~:text=Curcumin%20based%20fluoresce	https://www.scopus.com/sourceid/24642	Indexed in UGC Care List, SCOPUS and Web of Science
111	**Repurposing of FDA-approved drugs to target MurB and MurE enzymes in Mycobacterium tuberculosis, Journal of Biomolecular Structure and**	Rani, J., Silla, Y., Borah, K., Ramachandran, S. & **Bajpai, U.**	Biomedical Science	Journal of Biomolecular Structure and	2019	1102, 1538	https://doi.org/10.1080/07391102.2019.1637280	https://www.tandfonline.com/doi/abs/10.1080/07391102.2019.1637280	https://mjl.clarivate.com/search-results?issn=0739-1102&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
112	**Polydopamine –aminoglycoside nanoconjugates: Synthesis, characterization, antimicrobial evaluation and cytocompatibility**	Singh, I., Priyam, A., Jha, D., **Dhawan, G.,** Gautam, H. K., & Kumar, P.	Biomedical Science	MATERIALS SCIENCE & ENGINEERING C-	2019	0191 (Elect	https://doi.org/10.1016/j.msec.2019.110284	https://www.sciencedirect.com/science/article/pii/S0928493119318946	https://www.scopus.com/sourceid/17813	Indexed in SCOPUS
113	**Identifying similar networks using structural hierarchy**	Saxena, R., **Kaur, S**., & Bhatnagar, V.	Computer Science	Physica A: Statistical Mechanics and its Applicatio	2019	0378-4371	https://doi.org/10.1016/j.physa.2019.04.265	https://www.sciencedirect.com/science/article/abs/pii/S0378437119306399	https://mjl.clarivate.com/search-results?issn=0378-4371&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
114	**The Impact Of Various Digitized Social Networking Media Through Text, Images And Videos On Language Usage**	Mishra, S., **Samal, C.K**., Yadav, N., & Choudhury, R.K.	Computer Science	INTERNATIONAL JOURNAL OF SCIENTIFIC	2019	2277-8616	http://www.ijstr.org/final-print/oct2019/The-Impact-Of-Various-Digitized-	http://www.ijstr.org/final-print/oct2019/The-Impact-Of-Various-Digitized-Social-Networking-Media-	https://www.scopus.com/sourceid/21100894501	Indexed in SCOPUS
115	**Analysis of Al0.15Ga0.85N/GaN/Al0.15Ga0.85N DH-HEMT for RF and Microwave Frequency Applications**	Chugh, N., Kumar, M., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Semiconductors	2019	1063-7826	https://doi.org/10.1134/S1063782619130050	https://link.springer.com/article/10.1134/S1063782619130050	https://mjl.clarivate.com/search-results?issn=1063-7826&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
116	**PERTURBED SIX-BODY CONFIGURATION WITH VARIABLE MASS**	Ansari, A. A., **Meena, K. R.,** & Prasad, S. R.	Mathematics	Romanian Astronomical Journal	2019	1220-5168	http://www.astro.ro/~roaj/30_2/14-ansari-2015	http://www.astro.ro/~roaj/30_2/14-ansari-2015	https://mjl.clarivate.com/search-results?issn=1220-5168&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
117	**Sheet carrier concentration and current–voltage analysis of Al0.15Ga0.85N/GaN/Al0.15Ga0.85N double heterostructure hemt incorporating the effect of traps**	Chugh, N., Kumar, M., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Microsystem Technologies	2019	9467076	https://doi.org/10.1007/s00542-019-04322-5	https://link.springer.com/article/10.1007/s00542-019-04322-5	nil	**PEER REVIEWED**

118	**Cytokine-induced expression of nitric oxide synthases in Chlamydia trachomatis-infected spontaneous aborters**	Prasad, P., **Singh, N.,** Das, B., Raisuddin, S., Dudeja, M., & Rastogi, S.	Biomedical Science	Journal of Maternal-Fetal and Neonatal Medicine	2019	1476-7058	: 10.1080/14767058.2018.1465914	https://pubmed.ncbi.nlm.nih.gov/29720007/	https://mjl.clarivate.com:/search-results?issn=1476-7058&hide_exact_match_fl=tru	**SCOPUS INDEXED**
119	**Does tumour necrosis factor alpha-induced cyclooxygenase-2 expression lead to spontaneous abortion in *Chlamydia trachomatis* -infected women**	**Singh N**, Prasad P, Das B, Rastogi S	Biomedical Science	Microbial Pathogenesis	2019	0882-4010	https://doi.org/10.1016/j.micpath.2020.103994	https://www.sciencedirect.com/science/article/pii/S0882401019308915?via%3Dihub	https://www.scopus.com/sourceid/22941	**SCOPUS INDEXED**
120	**Hyperoxidation of Peroxiredoxin 6 Induces Alteration from Dimeric to Oligomeric State**	Shahnaj S, **Chowhan R K**, Potshangbam A M, Kakchingtabam P, Singh K H, Singh L R,	Biomedical Science	Antioxidants	2019	2076-3921	10.3390/antiox8020033.	https://pubmed.ncbi.nlm.nih.gov/30717364/	https://mjl.clarivate.com:/search-results?issn=2076-3921&hide_exact_match_fl=tru	**SCOPUS INDEXED**
121	**Prion protein transcription is auto-regulated through dynamic interactions with G-quadruplex motifs in its own promoter**	**Pradhan, P**, Srivastava A, Singh J, Biswas B, Saini A, Siddique I, ... & Kumar S, Kundu B	Biomedical Science	Biochimica et Biophysica Acta (BBA)-Gene	2019	1876-4320	10.1016/j.bbagrm.2019.194479.	https://pubmed.ncbi.nlm.nih.gov/31931179/	https://mjl.clarivate.com:/search-results?issn=1874-9399&hide_exact_match_fl=tru	**SCOPUS INDEXED**
122	**A study of software reliability on big data open source software**	, **Subhash Kumar** & T	Physics	International Journal of System Assurance Engineerin	2019	0976-4348	https://doi.org/10.1007/s13198-019-00777-x	https://link.springer.com/article/10.1007/s13198-019-00777-x	https://mjl.clarivate.com:/search-results?issn=0975-6809&hide_exact_match_fl=tru	**SCOPUS INDEXED**
123	**A Case Study on R: a powerful OSS and data analysis platform**	**Ranjan Kumar,** Subhash Kumar**,** Sanjay K. Tiwary	Physics	International Journal of Applied Engineering Research	2019	0973-4562	https://www.ripublication.com/ijaer19/ijaerv14n9_31.pdf	https://www.ripublication.com/ijaer19/ijaerv14n9_31.pdf	nil	**PEER REVIEWED**
124	**Dynamics of a vertically vibrating mercury drop**	T Singla, **DK Verma**, JF Tovar, A Figueroa, F Vázquez, FB Yousif	Physics	AIP Advances	2019	2158-3226	https://doi.org/10.1063/1.5088043	https://pubs.aip.org/aip/adv/article/9/4/045204/1076422/Dynamics-of-a-vertically-vibrating-mercury-drop	https://mjl.clarivate.com:/search-results?issn=2158-3226&hide_exact_match_fl=tru	**SCOPUS INDEXED**
125	**Fabrication and characterization of ZnO-TiO_2-PANI (ZTP) micro/nanoballs for the detection of flammable and toxic gases**	**Rakesh Kumar Sonker,** B.C. Yadav, Vinay Gupta, Monika Tomar	Physics	Journal of Hazardous Materials	2019	1873-3336	https://doi.org/10.1016/j.jhazmat.2018.10.016	https://www.sciencedirect.com/science/article/abs/pii/S0304389418309166	https://mjl.clarivate.com:/search-results?issn=0304-3894&hide_exact_match_fl=tru	**SCOPUS INDEXED**

126	**Investigation of thermodynamical, dielectric and electro-optical parameters of nematic liquid crystal doped with polyaniline and silver nanoparticles**	T. Vimal, K. Agrahari, **Rakesh Kumar Sonker**, R. Manohar	Physics	Journal of Molecular Liquids	2019	1873-3166	https://doi.org/10.1016/j.molliq.2019.111241	https://www.sciencedirect.com/science/article/abs/pii/S0167732219309481	https://mjl.clarivate.com:/search-results?issn=0167-7322&hide_exact_match_fl=tru	**SCOPUS INDEXED**
127	**Synthesis and characterization of highly porous hexagonal shaped CeO_2-Gd_2O_3-CoO nanocomposite and its opto-electronic humidity sensing**	S. Sikarwar, B.C. Yadav, **Rakesh Kumar Sonker**, G.I. Dzhardimalieva, J.K. Rajput	Physics	Applied Surface Science	2019	1873-5584	https://doi.org/10.1016/j.apsusc.2019.02.108	https://www.sciencedirect.com/science/article/abs/pii/S0169433219304337	https://mjl.clarivate.com:/search-results?issn=0169-4332&hide_exact_match_fl=tru	**SCOPUS INDEXED**
128	**Entrainment of aperiodic and periodic oscillations in the Mercury Beating Heart system using external periodic forcing**	P Kumar, P Parmananda**, DK Verma,** T Singla, I de Nicolás, J Escalona	Physics	Chaos: An Interdisciplinary Journal of Nonlinear	2019	1054-1500	https://doi.org/10.1063/1.5083179	https://pubmed.ncbi.nlm.nih.gov/31154773/	nil	**PEER REVIEWED**
129	**Recyclable Organocatalysts for One-pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone Spirooxindoles**	Liu, M.; Zhang, X.; Huang, X.; **Dhawan, G.;** Evans, J.; Kaur, M.; Jasinski, J. P.; Zhang, W.	Biomedical Science	Eur. J. Org. Chem	2019	1099-0690	https://doi.org/10.1002/ejoc.201801480	https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/ejoc.201801480#:~:text=Recyclable%20fluorous	https://mjl.clarivate.com:/search-results?issn=1434-193X&hide_exact_match_fl=tru	**SCOPUS INDEXED**
130	**Morphology of the Small Magellanic Cloud using multiwavelength photometry of classical Cepheids**	Sukanta Deb, Kerdaris Kurbah, Harinder P Singh, Shashi M Kanbur, Chow-Choong	Physics	Monthly Notices of Royal Astronomical Society	2019	0035-8711	https://doi.org/10.1093/mnras/stz2328	https://academic.oup.com/mnras/article/489/3/3725/5553489	https://mjl.clarivate.com:/search-results?issn=0035-8711&hide_exact_match_fl=tru	**SCOPUS INDEXED**
131	**Theoretical and experimental investigation on structural stability, electronic and vibrational properties of polvaniline (PANI)**	**Rakesh Kumar Sonker**, R. Shastri, B.C. Yadav	Physics	Proceedings of the Jangjeon Mathematical	2019	1598-7264	http://dx.doi.org/10.17777/pjms2019.22.1.129	https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE10700506	nil	**PEER REVIEWED**
132	**Structural basis of peroxidase catalytic cycle of human Prdx6**	**Chowhan, R. K.**	Biomedical Science	Scientific reports	2020	2045-2322	https://doi.org/10.1038/s41598-020-74052-6	https://www.nature.com/articles/s41598-020-74052-6#:~:text=The%20peroxidase%20catalytic%20cycle%20of	https://mjl.clarivate.com/search-results?issn=2045-2322&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
133	**Experimental validation of influenza A virus matrix protein (M1) interaction with host cellular alpha enolase and pyruvate kinase**	**Deepshikha**	Biomedical Science	Virology	2020	0042-6822	https://doi.org/10.1016/j.virol.2020.07.019	https://www.sciencedirect.com/science/article/pii/S004268222030146X?via%3Dihub	https://mjl.clarivate.com/search-results?issn=0042-6822&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

134	**Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films**	**Dhingra, V.,** Kumar, S., Kumar, R**.**, Garg, A., & Chowdhuri, A**.**	Electronics and Physics	Materials Research Express	2020	2053-1591	DOI 10.1088/2053-1591/ab9ae7	https://iopscience.iop.org/article/10.1088/2053-1591/ab9ae7#:~:text=In%20the%20current%20investigati	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
135	**Extraction of admittance parameters of symmetrically doped AlGaN/GaN/AlGaN DH-HEMT for microwave frequency applications.**	Chugh, N., Kumar, M., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Microsystem Technologies	2020	0946-7076	https://doi.org/10.1007/s00542-020-04805-w	https://link.springer.com/article/10.1007/s00542-020-04805-w	https://mjl.clarivate.com/search-results?issn=0946-7076&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
136	**Synthesis of CdS nanoparticle by sol-gel method as low temperature NO_2 sensor**	**Sonker R.K.,** Yadav B.C., Gupta V., & Tomar M.	Physics	Materials Chemistry and Physics	2020	0254-0584	https://doi.org/10.1016/j.matchemphys.2019.121975	https://www.sciencedirect.com/science/article/abs/pii/S0254058419307746	https://mjl.clarivate.com/search-results?issn=0254-0584&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
137	**Optimizing synthesis of Citrus limetta peel silver nanocomposites possessing larvicidal potential against dengue vector, Aedes aegypti L.**	Aggarwal, D., **Sharma, A.**, & Kumar, S.	Zoology	Advances in Zoology and Botany	2020	2331-5083	DOI: 10.13189/azb.2020.080103	https://www.hrpub.org/journals/article_info.php?aid=8630	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002048&flag=Sear	Indexed in UGC Care List
138	**One pot synthesis of silver nano-composites from Achyranthes aspera: An eco-friendly larvicide against Aedes aegypti L.**	**Sharma, A**., Tripathi, P., & Kumar, S.	Zoology	Asian Pacific Journal of Tropical Biomedici	2020	2221-1691	10.4103/2221-1691.275420	https://journals.lww.com/aptb/fulltext/2020/10020/one_pot_synthesis_of_silver_nanocomposites_from_2.aspx	https://mjl.clarivate.com/search-results?issn=2221-1691&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
139	**Effect of dietary stress of emamectin benzoate on the Fitness Cost of American Bollworm, Helicoverpa armigera (Hübner, 1808).**	Dagar, V.S., **Mishra, M.**, & Kumar, S.	Zoology	International Journal of Tropical Insect Science	2020	7584 / 1742	https://doi.org/10.1007/s42690-020-00168-x	https://link.springer.com/article/10.1007/s42690-020-00168-x	https://mjl.clarivate.com/search-results?issn=1742-7584&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
140	**Effects of β-sitosterol on growth, development and midgut enzymes of Helicoverpa armigera Hübner.**	**Mishra, M.**, Sharma, A., Dagar, V.S., & Kumar, S.	Zoology	Archives of Biological Sciences	2020	4664 / 182	https://doi.org/10.2298/ABS200308021M	http://www.doiserbia.nb.rs/Article.aspx?ID=0354-46642000021M#.Y7P_8XZBzrc	https://mjl.clarivate.com/search-results?issn=0354-4664&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
141	**Potential applications of extracellular enzymes from Streptomyces spp. in various industries**	Kumar, M., Kumar, P., **Das, P**., Solanki, R., & Kapur, M.K**.**	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-01898-9	https://link.springer.com/article/10.1007/s00203-020-01898-9	https://www.scopus.com/sourceid/19623	Indexed in UGC Care List, SCOPUS and Web of Science

142	**Description of a new species of Tetmemena (Ciliophora, Oxytrichidae) using classical and molecular markers**	Gupta, R., Abraham, J. S., **Sripoorna, S**., Maurya, S., Toteja, R., Makhija, S., ... & El-Serehy, H. A.	Zoology	Journal of King Saud University-Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.03.009	https://www.sciencedirect.com/science/article/pii/S1018364720301026	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
143	**Spiro-Indole-Coumarin Hybrids: Synthesis, ADME, DFT, NBO Studies and In Silico Screening through Molecular Docking on DNA G-Quadruplex**	Khanna, L., Singhal, S., Jain, S. C., & **Khanna, P.**	Chemistry	Chemistry Select	2020	5-6549 (On	https://doi.org/10.1002/slct.201904783	https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/slct.201904783	https://www.scopus.com/sourceid/21100850505	Indexed in UGC Care List, SCOPUS and Web of Science
144	**Biogenic Silver Nanoparticles: Evaluation of Their Biological and Catalytic Potential**	Sharma, B., Singh, I., Bajar, S., **Gupta, S.,** Gautam, H. & Kumar, P.	Chemistry	Indian Journal of Microbiology	2020	0046-8991	https://doi.org/10.1007/s12088-020-00889-0	https://link.springer.com/article/10.1007/s12088-020-00889-0	https://www.scopus.com/sourceid/19735	Indexed in UGC Care List, SCOPUS and Web of Science
145	**Ultrashort peptide self-assembly: Front-runners to transport drug and gene cargos.**	**Gupta, S.,** Singh, I., Sharma, A. K., & Kumar, P**.**	Chemistry	Frontiers in bioengineering and biotechnol	2020	2296-4185	https://doi.org/10.3389/fbioe.2020.00504	https://www.frontiersin.org/articles/10.3389/fbioe.2020.00504/full	https://www.scopus.com/sourceid/21100835954	Indexed in UGC Care List, SCOPUS and Web of Science
146	**Adsorption of Rhodamine 6G dye on binary system of Nanoarchitectonics composite Magnetic Graphene Oxide Material**	Drashya, Lal, S., & Hooda, S.	Chemistry	Journal of Nanoscience and Nanotechnology	2020	1533-4880	https://doi.org/10.1166/jnn.2020.17442	https://www.ingentaconnect.com/content/asp/jnn/2020/00000020/00000005/art00033;jsessionid=13icve188up89.x-ic	https://www.scopus.com/sourceid/28546	Indexed in SCOPUS
147	**Magnetic Graphene Oxide/Chitin Nanocomposites for Efficient Adsorption of Methylene Blue and Crystal Violet from Aqueous Solutions**	Gautam, D., & **Hooda, S.**	Chemistry	JOURNAL OF CHEMICAL AND ENGINEER	2020	0021-9568	https://doi.org/10.1021/acs.jced.0c00350	https://pubs.acs.org/doi/10.1021/acs.jced.0c00350	https://www.scopus.com/sourceid/24158	Indexed in UGC Care List and Web of Science
148	**Complexity Dynamics of Gumowski-Mira Map**	**Prasad S. N.,** Meena K. R., & Ansari A. A.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/06/15-	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/06/15-R1363_AAM_Ansari_AAA_010420_Fin	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=tru	Indexed in Web of Science
149	**Chaos Measure in autonomous LPA Model**	**Prasad S. N.,** Saha L. M., & Ansari A. A.	Mathematics	Gedrag En Organisatie review	2020	0921-5077	DOI:10.37896/GOR33.02/271	https://lemma-tijdschriften.com/gallery/goj-1864.pdf	https://mjl.clarivate.com/search-results?issn=0921-5077&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

150	**Supply chain model for expiring items following Ramp-type demand with stochastic lead time under crisp and fuzzy environment**	**Singh C.**, & Singh S. R.	Mathematics	International Journal of Fuzzy System Applicatio	2020	2156-177X	DOI: 10.4018/IJFSA.2020010103	https://www.igi-global.com/gateway/article/245271#pnlRecommendationForm	https://www.scopus.com/sourceid/21100301444	Indexed in UGC Care List and SCOPUS
151	**The anti-oxidant enzyme, Prdx6 might have cis-acting regulatory sequence(s).**	Shahnaj, S., Potshangbam, A.M., **Chowhan, R.K.**, Parray, Z.A., Kakchingtabam, P.,	Biomedical Science	International Journal of Biological Macromol	2020	0003 (Elect	https://doi.org/10.1016/j.ijbiomac.2020.01.311	https://www.sciencedirect.com/science/article/abs/pii/S0141813019397971?via%3Dihub	https://mjl.clarivate.com/search-results?issn=0141-8130&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
152	**Screening of Antitubercular Compound Library Identifies Inhibitors of Mur Enzymes in Mycobacterium tuberculosis**	Eniyan, K., Rani, J., Ramachandran, S., Bhat, R., Khan, I.A. & **Bajpai, U.**	Biomedical Science	SLAS DISCOVERY	2020	5560 (Elect	https://doi.org/10.1177/24725552198811148	https://slas-discovery.org/article/S2472-5552(22)06529-7/fulltext	https://mjl.clarivate.com/search-results?issn=2472-5552&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
153	**Characterization and genome analysis of B1 sub-cluster mycobacteriophage PDRPxv**	Sinha, A., Eniyan, K., Manohar, P., Ramesh, N., & **Bajpai, U.**	Biomedical Science	Virus research	2020	7492 (Elect	https://doi.org/10.1016/j.virusres.2020.197884Get rights and content	https://www.sciencedirect.com/science/article/abs/pii/S0168170219307518	https://mjl.clarivate.com/search-results?issn=0168-1702&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
154	**Functional characterization of the endolysins derived from mycobacteriophage PDRPxv**	Eniyan, K., Sinha, A., Ahmad, S., & **Bajpai, U.**	Biomedical Science	World journal of microbiology & biotechnol	2020	0972 (Elect	https://doi.org/10.1007/s11274-020-02858-7	https://link.springer.com/article/10.1007/s11274-020-02858-7	https://mjl.clarivate.com/search-results?issn=0959-3993&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
155	**Estimating Parameter of the Selected Uniform Population Under the Generalized Stein Loss Function**	**Meena K. R.,** & Gangopadhyay A. K.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/10_R1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/10_R1387_AAM_Gangopadhyay_AKG_0	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=tru	Indexed in Web of Science
156	**Reliable Path Finding Technique for Mobile Robot**	Choudhury, R. K., and **Samal, C.K.**	Computer Science	Journal of Computer Science and Technolog	2020	9000 / 1860	https://www.researchgate.net/profile/Chandrakanta-Samal/publication/3603975	https://www.researchgate.net/profile/Chandrakanta-Samal/publication/360397516_Reliable_Path_Finding_Tec	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101001966&flag=Sear	Indexed in UGC Care List, SCOPUS and Web of Science
157	**Android-based application for shading analysis and assessment of actual solar energy potential**	**Garg, A.,** Sharma, P., Verma, V., & Kaur, T.	Electronics	New Concepts in Solar and Thermal	2020	0277-786X	https://doi.org/10.1117/12.2570966	https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11496/114960G/Android-based-	https://www.scopus.com/sourceid/40067	Indexed in SCOPUS

158	**Some fun pedagogical techniques to teach optics to students of all ages.**	**Garg, A.,** Sharma, P., Prajapat, P., Saxena, A., Pandey, P., Tyagi, A., Varshney, Y. &	Electronics	Optics Education and Outreach VI (Vol.	2020	0277-786X	https://doi.org/10.1117/12.2570964	https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11480/114800R/Some-fun-	https://www.scopus.com/sourceid/40067	Indexed in SCOPUS
159	**Trace detection of Nerve agent simulant in the fuel vapor environment using metal oxide/Surface acoustic wave E-nose**	Kumar, J., Singh, H., **Raj, V. B.,** Nimal, A. T., Gupta, V. & Singh, V. K.	Physics	Defence Science Journal	2020	379X , 2456	DOI:10.14429/dsj.70.14584	https://core.ac.uk/download/pdf/335056862.pdf	https://www.scopus.com/sourceid/21100967064#tabs=1	Indexed in UGC Care List, SCOPUS and Web of Science
160	**Green synthesis of TiO2 nanosheet by chemical method for the removal of Rhodamine B from industrial waste**	**Sonker, R.K.,** Yadav, B.C., Gupta, V. & Tomar, M.	Physics	Materials Science And Engineering B: Solid-	2020	0921-5107	https://doi.org/10.1016/j.mseb.2020.114557Get rights and content	https://www.sciencedirect.com/science/article/abs/pii/S0921510720300842	https://mjl.clarivate.com/search-results?issn=0921-5107&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
161	**An overview of the factors affecting dengue transmission in Asian region and its predictive models.**	Samal, R.R., Gupta, S. & **Kumar, S.**	Zoology	Journal of Applied and Natural Science	2020	2231-5209	https://doi.org/10.31018/jans.v12i3.2360	https://journals.ansfoundation.org/index.php/jans/article/view/2360	https://www.scopus.com/sourceid/21101016916	Indexed in SCOPUS
162	**Comparative larvicidal efficacy of α-cypermethrin alone and α-cypermethrin/Citrus sinensis peel extract binary mixtures against Aedes aegypti L.**	Aggarwal, D, Samal, R. R. & **Kumar, S.**	Zoology	Romanian Journal of Biology-Zoology	2020	2248-3799	https://www.researchgate.net/profile/Roopa-Samal-2/publication/349324045_C	https://www.researchgate.net/profile/Roopa-Samal-2/publication/349324045_COMPARATIVE_LARVICIDAL	https://mjl.clarivate.com/search-results?issn=1843-7761&hide_exact_match_fl=tru	Indexed in Web of Science
163	**Reduced physiological and reproductive fitness induced by Nerium oleander leaf extracts in the cotton bollworm, Helicoverpa armigera (Lepidoptera: Noctuidae).**	Sivakumar, A., Mishra, M., Dagar, V. & **Kumar, S.**	Zoology	Acta Ecologica Sinica	2020	1872-2032	https://doi.org/10.1016/j.chnaes.2020.12.002	https://www.sciencedirect.com/science/article/abs/pii/S1872220322030233X	https://mjl.clarivate.com/search-results?issn=1000-0933&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
164	**Protection of surplus food from fungal spoilage using Streptomyces spp.: a green approach**	Kumar, M., Kumar, P., Das, P., Solanki, R., & **Kapur, M.K.**	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-02087-4	https://link.springer.com/article/10.1007/s00203-020-02087-4	https://mjl.clarivate.com/search-results?issn=0302-8933&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
165	**Draft genome and secondary metabolite biosynthetic gene clusters of Streptomyces sp. strain 196.**	Kumar, P., Chauhan, A., Kumar, M., Kuanr, B.K., Solanki, R., & **Kapur, M.K.**	Zoology	Molecular Biology Reports	2020	1573-4978	https://doi.org/10.1007/s11033-020-05731-w	https://link.springer.com/article/10.1007/s11033-020-05731-w	https://mjl.clarivate.com/search-results?issn=0301-4851&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

166	**Indicators for assessment of soil quality: a mini-review**	Maurya, S., Abraham, J. S., Somasundaram, S., **Toteja, R.,** Gupta, R., & Makhija, S.	Zoology	Environmental Monitoring and Assessmen	2020	0167-6369	https://doi.org/10.1007/s10661-020-08556-z	https://link.springer.com/article/10.1007/s10661-020-08556-z	https://mjl.clarivate.com/search-results?issn=0167-6369&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
167	**Ibuprofen-based chemosensor for efficient binding and sensing of Cu2+ ion in aqueous medium**	Lal, S., Prakash, K., Hooda, S.**, Kumar V.** & Kumar, P.	Chemistry	Journal of Molecular Structure	2020	0022-2860	https://doi.org/10.1016/j.molstruc.2019.127003	https://www.sciencedirect.com/science/article/abs/pii/S0022286019311032	https://mjl.clarivate.com/search-results?issn=0022-2860	Indexed in UGC Care List, SCOPUS and Web of Science
168	**Fabrication of a Gold-Supported NiAlTi-LayeredDouble Hydroxide Nanocatalyst for Organic Transformations**	Rathee, G., Kohli S., Panchal, S., Singh, N., Awasthi, A., Singh, S., Singh, A., **Hooda, S.** &	Chemistry	ACS OMEGA	2020	2470-1343	https://doi.org/10.1021/acsomega.0c03250	https://pubs.acs.org/doi/full/10.1021/acsomega.0c03250	https://mjl.clarivate.com/search-results?issn=2470-1343&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
169	**Natural Polysaccharide Based Graphene Oxide Nanocomposites for Removal of Dyes from Wastewater: A Review**	Gautam, D., Saya, L., Malik, V., Singh, W. R., & **Hooda, S.**	Chemistry	Journal of Chemical & Engineering data	2020	9568 ,1520	https://doi.org/10.1021/acs.jced.0c00743	https://pubs.acs.org/doi/abs/10.1021/acs.jced.0c00743	https://mjl.clarivate.com/search-results?issn=0021-9568&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
170	**Self Nitrogen doped carbon Arogel drived from waste Cigarette buts (Cellulose acetate) for the adsorption of BPA : Kinetics and adsorption mechanism**	Norah S., Alhokbany Naushad, M., **Kumar, V.,** Hatim, S-Al, & M. Saad Alshehri,Tansir	Chemistry	Journal of King Saud University Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.09.021	https://www.sciencedirect.com/science/article/pii/S1018364720302895	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
171	**Design and synthesis of various 5'-Deoxy-5'-(4-Substituted-1,2,3-Triazol-1- yl)-uridine analogues as inhibitors of Mycobacterium tuberculosis Mur ligases**	Hervin V., Arora R., Rani J., Ramchandran S**., Bajpai U.,** Agrofoglio L.A., Roy	Biomedical Science	Molecules	2020	1420-3049	https://doi.org/10.3390/molecules25214953	https://www.mdpi.com/1420-3049/25/21/4953	https://mjl.clarivate.com/search-results?issn=1420-3049&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
172	**Neem flowers (Azadirachta indica) as an abundant source of nectar for butterflies in an urban landscape in Delhi, India**	**Chaudhary, R.**	Biomedical Science	Bionotes	2020	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2022%20(3)/FINAL-BIONOTES-	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science
173	**A comprehensive checklist of butterflies seen in Corbett Tiger Reserve, Uttarakhand, India**	**Chaudhary, R.,** Chhimwal, S., & Kumar, V.	Biomedical Science	Bionotes	2020	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2022%20(3)/FINAL-BIONOTES-	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science

174	**Oviposition by Jamides bochus (Stoll, [1782]) (Insecta: Lepidoptera: Lycaenidae) in New Delhi, India**	**Chaudhary, R.** & Kumar, V.	Biomedical Science	Bionotes	2020	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2022%20(3)/FINAL_BIONOTES_	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science
175	**Diabetes: Perspective and challenges in modern era.**	Goel, Y., Verma, A.K., Bhatt, D., Rahmani, A.H., **Yasheshwar**, & Dev K.	Botany	Gene Reports	2020	2452-0144	https://doi.org/10.1016/j.genrep.2020.100759	https://www.sciencedirect.com/science/article/pii/S2452014420301734#:~:text=Prevalence%20of%20diabetes%20is	https://mjl.clarivate.com/search-results?issn=2452-0144&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
176	**Vertical Motion of the Variable Infinitesimal Mass in the Cicular Sitnikov Problem**	Ansari, A.A., **Prasad, S.N.** & Singh, C.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/41_R1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/41_R1397_AAM_Ansari_AA_051220_Pu	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=tru	Indexed in Web of Science
177	**Generalized Elliptic Restricted Four-Body Problem with Variable Mass**	**Prasad, S. N.** & Ansari, A. A.	Mathematics	Astronomy Letters	2020	1063-7737	https://doi.org/10.1134/S1063773720040015	https://link.springer.com/article/10.1134/S1063773720040015	https://mjl.clarivate.com/search-results?issn=1063-7737&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
178	**The Motion Properties of the Variable Mass Planetoid in the Elliptical Sitnikov Problem**	Ansari, A.A., **Narain, L.** & Prasad, S.N.	Mathematics	Gedrag En Organisatie review	2020	0921-5077	DOI:10.37896/GOR33.03/436	https://drive.google.com/file/d/1IbtP1neYawuT8nEaSv8JogFZeTIHrgZ_/view	https://mjl.clarivate.com/search-results?issn=0921-5077&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
179	**EPQ MODEL WITH GREEN PRODUCTION, PRODUCT STEWARD SHIP AND SELLING PRICE DEPENDENT DEMAND**	Saxena, P., **Singh, C.** & Sharma, K.	Mathematics	INTERNATIONAL JOURNAL OF AGRICULT	2020	0973-1903	DOI: 10.1007/978-981-10-5687-1_10	https://link.springer.com/chapter/10.1007/978-981-10-5687-1_10	https://mjl.clarivate.com/search-results?issn=0973-1903&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
180	**Green design and product stewardship approach for two-warehouse inventory model**	Saxena, P., **Singh, C.** & Sharma, K.	Mathematics	Indian Journal of Science and Technolog	2020	0974-6846	10.17485/IJST/v13i37.290	https://indjst.org/articles/green-design-and-product-stewardship-approach-for-two-warehouse-	https://mjl.clarivate.com/search-results?issn=0974-6846&hide_exact_match_fl=tru	Indexed in Web of Science
181	**Generalized cr3b problem with heterogeneous primary and secondary as finite straight segment**	Ansari, A.A., **Meena, K. R.** & K. Shalini	Mathematics	Application and Applied mathematics	2020	1932-9466	https://digitalcommons.pvamu.edu/cgi/viewcontent.cgi?article=1918&context=aa	https://digitalcommons.pvamu.edu/cgi/viewcontent.cgi?article=1918&context=aam	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=tru	Indexed in Web of Science

182	**A comprehensive review on potential therapeutics interventions for COVID-19.**	Chugh, H., Awasthi, A., Agarwal, Y., Gaur, R. K., **Dhawan, G.**, & Chandra, R. (2020).	Biomedical Science	European journal of pharmacology	2020	1879-0712	https://doi.org/10.1016/j.ejphar.2020.173741	https://www.sciencedirect.com/science/article/pii/S0014299920308335	https://mjl.clarivate.com:/search-results?issn=0014-2999&hide_exact_match_fl=tru	**SCOPUS INDEXED**
183	**Fe3 O4 loaded chitin–A promising nano adsorbent for Reactive Blue 13 dye.**	Gautam, D., Saya, L., & **Hooda, S.**	Chemistry	Environmental Advances	2020	2666-7657	https://doi.org/10.1016/j.envadv.2020.100014	https://www.sciencedirect.com/science/article/pii/S2666765720300144?via%3Dihub	https://www.scopus.com/sourceid/21101065035	**SCOPUS INDEXED**
184	**Synthesis of Silver Nanoparticles by Phyllanthus emblica Plant Extract and Their Antibacterial Activity**	Meena, R. K., Meena, R., **Arya, D. K.**, Jadoun, S., Hada, R., & Kumari, R. (2020).	Chemistry	Material Science Research India	2020	0973-3469	http://dx.doi.org/10.13005/msri/170206	http://www.materialsciencejournal.org/vol17no2/synthesis-of-silver-nanoparticles-by-phyllanthus-	nil	**PEER REVIEWED**
185	**Artificial Intelligence Assisted Smart Mirror**	**Garg, A.,** Sharma, P., Verma, V., Yadav, S., & Tyagi, A.	Electronics	International Journal of Scientific and	2020	2454-1532	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	nil	**PEER REVIEWED**
186	**Enhancement in NH3 sensing performance of ZnO thin-film via gamma-irradiation.**	Waikar, M. R., Raste, P. M., **Sonker, R. K.**, Gupta, V., Tomar, M., Shirsat, M. D., &	Physics	Journal of Alloys and Compounds	2020	1873-4669	https://doi.org/10.1016/j.jallcom.2020.154641	https://www.sciencedirect.com/science/article/abs/pii/S0925838820310045?via%3Dihub	https://www.scopus.com/sourceid/12325	**SCOPUS INDEXED**
187	**Post-γ-irradiation effects on structural, optical and morphological properties of chemical vapour deposited MWCNTs.**	Waikar, M. R., **Sonker, R. K.**, Gupta, S., Chakarvarti, S. K., & Sonkawade, R. G.	Physics	Materials Science in Semiconductor Processing	2020	1873-4081	https://doi.org/10.1016/j.mssp.2020.104975	https://www.sciencedirect.com/science/article/abs/pii/S1369800119323443?via%3Dihub	https://mjl.clarivate.com:/search-results?issn=1369-8001&hide_exact_match_fl=tru	**SCOPUS INDEXED**
188	**Chemistry and Pharmacology of Miraculous, Echinacea purpurea L.**	**Arya, D. K**	Chemistry	Journal of Biological and Chemical Research	2020	0970-4973	https://www.jbcr.co.in/Current_Issue/Vol_37_1_Jan_Jun_2020/21.%20Echnesea	https://www.jbcr.co.in/Current_Issue/Vol_37_1_Jan_Jun_2020/21.%20Echnesea%20Paper%20180-187.pdf	nil	**PEER REVIEWED**
189	**Chemical Research, 37, 180-187, ISSN 0970-4973.**	Aggarwal D, Sharma A, **Kumar, S.** (2020)	Zoology	Advances in Zoology and Botany	2020		10.13189/azb.2020.080103	https://www.hrpub.org/download/20191230/AZB3-11414236.pdf	nil	**PEER REVIEWED**

190	**pH induced conformational alteration in human peroxiredoxin 6 might be responsible for its resistance against lysosomal pH or high temperature**	**Chowhan, R. K.**	Biomedical Science	Scientific reports	2021	2045-2322	https://doi.org/10.1038/s41598-021-89093-8	https://www.nature.com/articles/s41598-021-89093-8	https://mjl.clarivate.com/search-results?issn=2045-2322&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
191	**Exploiting Emojis in Sentiment Analysis : A Survey**	**Grover, V.**	Computer Science	Journal of The Institution of Engineers	2021	2250-2114	CARE Listed Journal,Sl.No. 10	https://link.springer.com/article/10.1007/s40031-021-00620-7	https://www.scopus.com/sourceid/21100831436	Indexed in UGC Care List and SCOPUS.
192	**Optimisation of dielectric spacer layer thickness in Ag nanospheres/ITO/c-Si structure for plasmonic solar cells using FDTD simulation.**	Rani, M., Kashyap, J., **Singh, U.**, & Kapoor, A.	Electronics	Materials Technology	2021	7857, 1753	https://doi.org/10.1080/10667857.2021.1940046	https://www.tandfonline.com/doi/abs/10.1080/10667857.2021.1940046	https://mjl.clarivate.com/search-results?issn=1066-7857&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
193	**Applicability of Field Plate in Double Channel GaN HEMT for Radio-Frequency and Power-Electronic Applications.**	Chugh, N., Kumar, M., Haldar, S., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Silicon	2021	1876-990X	https://doi.org/10.1007/s12633-020-00881-9	https://link.springer.com/article/10.1007/s12633-020-00881-9	https://mjl.clarivate.com/search-results?issn=1876-990X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
194	**Gamma Rays Induced Modification in Ultrahigh Molecular Weight Polyethylene (UHMWPE)**	Aarya, S., **Kumar, P.,** Bhatia, M., Kumar, S. Sharma, J. & Siddhartha	Physics	Advances in Polymer Technology	2021	0730-6679	https://doi.org/10.1155/2021/7013154	https://www.hindawi.com/journals/apt/2021/7013154/	https://mjl.clarivate.com/search-results?issn=0730-6679&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
195	**Superficial Synthesis of CdS Quantum Dots for an Efficient Perovskite-Sensitized Solar Cell**	**Sonker, R. K.,** Shastri, R. & Johari, R.	Physics	Energy & Fuels	2021	0887-0624	https://doi.org/10.1021/acs.energyfuels.1c00629	https://pubs.acs.org/doi/abs/10.1021/acs.energyfuels.1c00629	https://mjl.clarivate.com/search-results?issn=0887-0624&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
196	**Influence of lufenuron on the nutrient content and detoxification enzyme expression in Aedes aegypti L. (Diptera: Culicidae)**	Kungreiliu, P., Samal, R.R., Lanbiliu, P. & **Kumar, S.**	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-021-00481-z	https://link.springer.com/article/10.1007/s42690-021-00481-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
197	**Cuticular thickness associated with insecticide resistance in Aedes aegypti**	**Samal, R.R**. & Kumar, S.	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-020-00271-z	https://link.springer.com/article/10.1007/s42690-020-00271-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

198	**Physiological and reproductive fitness cost in Aedes aegypti on exposure to toxic xenobiotics in New Delhi, India**	Gupta, A., **Samal, R.R**. & Kumar, S.	Zoology	Journal of Applied and Natural Science	2021	2231-5209	https://doi.org/10.31018/jans.v13i1.2470	https://journals.ansfoundation.org/index.php/jans/article/view/2470	https://www.scopus.com/sourceid/21101016916	Indexed in SCOPUS
199	**Proactive role of Streptomyces spp. in plant growth stimulation and management of chemical pesticides and fertilizers**	Kumar, M., Kumar, P., **Das, P**., Solanki, R., & Kapur, M.K**.**	Zoology	Internatio nal Journal of Environme ntal	2021	1735-2630	https://doi.org/10.1007/s13762-021-03473-1	https://link.springer.com/article/10.1007/s13762-021-03473-1	https://www.scopus.com/sourceid/4000148503	Indexed in SCOPUS
200	**Exploring Small Heat Shock Proteins (sHSPs) for Targeting Drug Resistance in Candida albicans and other Pathogenic Fungi.**	**Dev, R.**	Zoology	Journal of Pure and Applied Microbiolo gy	2021	0973-7510	https://doi.org/10.22207/JPAM.15.1.42	https://pdfs.semanticscholar.org/f40d/33f7d5878e6410b4b23f2f4e53efcaf5b336.pdf	https://www.scopus.com/sourceid/11700154322	Indexed in SCOPUS
201	**Characterization of Euplotes lynni nov. spec., E. indica nov. spec. and description of E. aediculatus and E. woodruffi (Ciliophora, Euplotidae) using an integrative approach**	Abraham, J. S., Somasundaram, S., Maurya, S., Gupta, R., **Makhija, S.,** & Toteja, R.	Zoology	European Journal of Protistolo gy	2021	0932-4739	https://doi.org/10.1016/j.ejop.2021.125779	https://www.sciencedirect.com/science/article/abs/pii/S0932473921000146	https://mjl.clarivate.com/search-results?issn=0932-4739&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
202	**Guar gum based nanocomposites: Role in water purification through efficient removal of dyes and metal ions**	Saya, L., Malik, V., Singh, A., Singh, S., **Gambhir, G.**, Singh, W.R., Chandra, R. and Hooda, S.	Chemistry	Carbohydr ate Polymers	2021	3617 / 187	https://doi.org/10.1016/j.carbpol.2021.117851	https://www.sciencedirect.com/science/article/abs/pii/S0144861721002381	https://mjl.clarivate.com:/search-results?issn=0144-8617&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
203	**Recent advances in a polydopamine mediated Antimicrobial Adhesion system**	Singh, I., **Dhawan, G.**, Gupta, S. & Kumar, P.	Biomedica l Sciences & Chemistry	Frontiers in Microbiolo gy	2021	1664302X	https://doi.org/10.3389/fmicb.2020.607099	https://www.frontiersin.org/articles/10.3389/fmicb.2020.607099/full	https://mjl.clarivate.com/search-results?issn=1664-302X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
204	**Antimicrobial, radical scavenging and dye degradation potential of nontoxic biogenic silver nanoparticles using Cassia fistula pods**	Singh, I., **Gupta, S**., Gautam, H.K., Kumar, P. & Dhawan, G**.**	Chemistry & Biomedica l Sciences	Chemical Papers	2021	7290, 0366	https://doi.org/10.1007/s11696-020-01355-3	https://link.springer.com/article/10.1007/s11696-020-01355-3	https://mjl.clarivate.com/search-results?issn=0366-6352&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
205	**Application of Chiotsan in Tissue Engineering**	Deka, S.R., **Gupta, S**. & Kumar, P.	Chemistry	Trends in Carbohydr ate Recearch	2021	0975-0304	https://www.trendscarbo.com/getf_shoppingcart.php?id=410026856	https://www.trendscarbo.com/getf_shoppingcart.php?id=410026856	https://mjl.clarivate.com/search-results?issn=0975-0304&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

206	**Mannosylated and Mannan Modified nano vector targeting Resident Tissue Macrophages (RTM) for efficient pharmacotherapy**	Singh, I., **Gupta, S**., Dhawan, G**.,** & Kumar, P	Chemistry & Biomedical Sciences	Trends in Carbohydrate Research	2021	0975-0304	https://www.trendscarbo.com/getf_shoppingcart.php?id=282868652	https://www.trendscarbo.com/getf_shoppingcart.php?id=282868652	https://mjl.clarivate.com/search-results?issn=0975-0304&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
207	**A review targeting the infection by CHIKV using computational and experimental approaches**	Kumar, D., Kumari, K., Chandra, R., Jain, P., Vodwal, L., **Gambhir, G.** and Singh, P.	Chemistry	Journal of Biomolecular Structure and	2021	1102 / 1538	https://doi.org/10.1080/07391102.2021.1904004	https://www.tandfonline.com/doi/abs/10.1080/07391102.2021.1904004?journalCode=tbsd20	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
208	**Synthesis Comparative in vitro anitbacterial antioxidant and UV Flourscence study of bis indol schiff base and molecular docking with ct -DNA and SARS-COV-2 M Pro**	Singhal, S., **Khanna, P.,** & Khanna, L.	Chemistry	Luminescence	2021	1522-7243	https://doi.org/10.1002/bio.4098	https://analyticalsciencejournals.onlinelibrary.wiley.com/doi/10.1002/bio.4098	https://mjl.clarivate.com/search-results?issn=1522-7235&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
209	**Multitarget Diallyl Disulfides (DADS) against Aβ Aggregation: Screening through Molecular Docking with Aβ42 & ZnII-Aβ16, ADME, DFT & Synthetic Strategy**	Singhal, S., Khanna, P**., Misra, N.** & Khanna, L	Chemistry	Chemistry Select	2021	2365-6549	https://doi.org/10.1002/slct.202004635	https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/slct.202004635	https://mjl.clarivate.com/search-results?issn=2365-6549&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
210	**Screening of compound library identifies novel inhibitors against the MurA enzyme of Escherichia coli**	Raina D., Tiwari H., Sharma S., Deepika, Chinthakindi P.K., Nargotra A., Sangwan P.L.,	Biomedical Science	Applied Microbiology and Biotechnology	2021	7598, 1432	https://doi.org/10.1007/s00253-021-11272-4	https://link.springer.com/article/10.1007/s00253-021-11272-4	https://mjl.clarivate.com/search-results?issn=0175-7598&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
211	**Shelter building behaviour of Hasora chromus (Cramer, 1780) larvae (Insecta: Lepidoptera: Hesperiidae)**	**Chaudhary, R.**	Biomedical Science	Bionotes	2021	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2023%20(1)/FINAL-BIONOTES-	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science
212	**Properties of Motion of the Infinitesimal Variable Mass Body in the Well Known Circular Restricted Three-Body Problem with Newtonian and Yukawa Potential**	Ansari, A.A., Alam, M., **Meena, K.R.** & Ali, A.	Mathematics	Applied Mathematics and Information Sciences	2021	0090, 2325	doi:10.18576/amis/150211	https://www.naturalspublishing.com/files/published/5m6qq3031il0qf.pdf	https://www.scopus.com/sourceid/21100197928	Indexed in SCOPUS
213	**On Estimating Scale Parameter of the Selected Pareto Population under the Generalized Stein Loss Function**	**Meena, K.R.,** Gangopadhyay, A.K., & Abdalghani, O.	Mathematics	AMERICAN JOURNAL OF MATHEM	2021	6324 , 2325	https://doi.org/10.1080/01966324.2021.1891999	https://www.tandfonline.com/doi/abs/10.1080/01966324.2021.1891999	https://www.scopus.com/sourceid/24650	Indexed in SCOPUS

214	**Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19**	Das, R., Kotra, K., Singh, P., Loh, B., Leptihn, S. and **Bajpai, U**	Biomedical Science	Infectious disease and therapy	2021	3229 / 219	https://doi.org/10.1007/s40121-021-00559-8	https://link.springer.com/article/10.1007/s40121-021-00559-8	https://mjl.clarivate.com:/search-results?issn=2193-8229&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
215	**Synthesis and characterization of nanoselenium: A step-by-step guide for undergraduate students**	**Dhawan, G.**, Singh, I., Dhawan, U., and Kumar, P	Biomedical Science	Journal of Chemical Education	2021	9584 / 193	https://doi.org/10.1021/acs.jchemed.0c01467	https://pubs.acs.org/doi/abs/10.1021/acs.jchemed.0c01467	https://mjl.clarivate.com:/search-results?issn=0021-9584&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
216	**Self-assembled biodegradable core-shell nanocomposites of amphiphilic retinoic acid-LMW bPEI conjugates exhibit enhanced transgene expression in**	Ahmadi, Z., Jena, H., Singh, M., **Dhawan, G.**, and Kumar, P.	Biomedical Science	Journal of Pharmaceutical Sciences	2021	0022-3549	https://doi.org/10.1016/j.xphs.2021.04.016	https://jpharmsci.org/article/S0022-3549(21)00238-0/fulltext	https://www.scopus.com/sourceid/23079	Indexed in UGC Care List, SCOPUS and Web of Science
217	**Fluorine-containing pharmaceuticals approved by the FDA in 2020: Synthesis and biological activity**	Yu, Y., Liu, A., **Dhawan, G.**, Mei, H., Zhang, W., Izawa, K., Soloshonok, V. A.,	Biomedical Science	Chinese Chemical Letters	2021	8417 / 187	https://doi.org/10.1016/j.cclet.2021.05.042	https://www.sciencedirect.com/science/article/abs/pii/S1001841721003557	https://mjl.clarivate.com:/search-results?issn=1001-8417&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
218	**Peroxiredoxin-6: A Guardian of Lung Pathophysiologies.**	Kumari, A., **Chowhan, R. K.**, Kakchingtabam, P., Shahnaj, S., Rahaman, H.,	Biomedical Science	Current Protein and Peptide Science	2021	2037 / 187	DOI: 10.2174/1389203722666211109101853	https://www.eurekaselect.com/article/118761	https://mjl.clarivate.com:/search-results?issn=1389-2037&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
219	**Signaling mechanisms and biochemical pathways regulating pollen-stigma interaction, seed development and seedling growth in sunflower under salt stress.**	Batla, S. C., Gogna, M., Jain, P., Singh, N., Mukherjee, S., **Kalra, G.**	Botany	Plant Signaling and Behaviour	2021	2316 / 155	https://doi.org/10.1080/15592324.2021.1958129	https://www.tandfonline.com/doi/full/10.1080/15592324.2021.1958129	https://mjl.clarivate.com:/search-results?issn=1559-2316&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
220	**Unraveling the AM fungal community for understanding its ecosystem resilience to changed climate in agroecosystems**	Chourasiya D., Gupta M. M, **Sahni S.,**Oehl F., Agnihotri R., Buade R., Maheshwari H. S.,	Botany	Symbiosis	2021	5114 / 187	https://doi.org/10.1007/s13199-021-00761-9	https://link.springer.com/article/10.1007/s13199-021-00761-9	https://mjl.clarivate.com:/search-results?issn=0334-5114&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
221	**Al_2O_3/CuI/PANInanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives**	**Kohli, S.**, Rathee, G., Hooda, S., and Chandra, R.	Chemistry	Dalton Transactions	2021	9226 / 147	https://doi.org/10.1039/D1DT00806D	https://pubs.rsc.org/en/content/articlelanding/2021/DT/D1DT00806D	https://mjl.clarivate.com:/search-results?issn=1477-9226&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

222	**Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti.**	Gupta, D., **Samal, R. R.**, Gautam, D., Hooda, S., and Kumar, S.	Chemistry	Journal of Applied and Natural Science	2021	0974-9411	https://doi.org/10.31018/jans.v13i4.3018	https://journals.ansfoundation.org/index.php/jans/article/view/3018	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
223	**A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater**	Saya, L., Malik, V., Gautam, D., **Gambhir, G.**, Singh, W. R. and Hooda, S.	Chemistry	Science of the Total Environment	2021	9697 / 1879	https://doi.org/10.1016/j.scitotenv.2021.152529	https://www.sciencedirect.com/science/article/abs/pii/S0048969721076075?via%3Dihub	https://mjl.clarivate.com:/search-results?issn=0048-9697&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
224	**In water" synthesis of bis (indolyl) methanes: a review**	Khanna, L., Mansi, Yadav, S., **Misra, N.**, and Khanna, P.	Chemistry	Synthetic Communications	2021	7911 / 1532	https://doi.org/10.1080/00397911.2021.1957113	https://www.tandfonline.com/doi/abs/10.1080/00397911.2021.1957113#:~:text=Bis(indolyl)%20methane%20(BIM wit	https://mjl.clarivate.com:/search-results?issn=0039-7911&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
225	**A DFT Study of Interaction of (CdSe) 3 Quantum Dots with Nucleobases.**	**Malik, P**., and Kakkar, R	Chemistry	Advanced Materials Letters	2021	0976-3961	10.5185/amlett.2021.081653	https://aml.iaamonline.org/article_14098.html	https://www.scopus.com/sourceid/21100223579	Indexed in SCOPUS
226	**Size-dependent structural and electronic properties of stoichiometric II–VI quantum dots and gas sensing ability of CdSe quantum dots: a DFT study**	Singh, J., Thareja, R., **Malik, P.**, and Kakkar, R.	Chemistry	Journal of Nanoparticle Research	2021	0764 / 1572	https://doi.org/10.1007/s11051-022-05406-6	https://link.springer.com/article/10.1007/s11051-022-05406-6	https://mjl.clarivate.com:/search-results?issn=1388-0764&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
227	**Surface engineered Iridium-based magnetic photocatalyst paving a path towards visible light driven CH arylation and cyanation reaction.**	Rana, P., Gaur, R., **Kaushik, B.**, P. Rana, Yadav, S., Yadav, P., Sharma, P., Gawande M. B.	Chemistry	Journal of Catalysis	2021	9517 / 1090	https://doi.org/10.1016/j.jcat.2021.08.014	https://www.sciencedirect.com/science/article/abs/pii/S002195172100316X?via%3Dihub	https://mjl.clarivate.com:/search-results?issn=0021-9517&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
228	**Unlocking the catalytic potency of a magnetic responsive CoFe 2 O 4/Ni-BTC MOF composite for the sustainable synthesis of tri-and tetra-substituted imidazoles.**	Yadav, S., Dixit, R., Sharma, S., Dutta, S., Arora, B., Rana, P., **Kaushik, B.**, Adholeya, A.,	Chemistry	Materials Chemistry Frontiers	2021	2052-1537	https://doi.org/10.1039/D1QM00904D	https://pubs.rsc.org/en/content/articlelanding/2021/QM/D1QM00904D	https://mjl.clarivate.com:/search-results?issn=2052-1537&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
229	**Enhanced catalysis through structurally modified hybrid 2-D boron nitride nanosheets comprising of complexed 2-hydroxy-4-methoxybenzophenone**	Rana, P., Dixit, R., Sharma, S., Dutta, S., Yadav, S., Sharma, A., **Kaushik, B.**,	Chemistry	Scientific reports	2021	2045-2322	https://doi.org/10.1038/s41598-021-03992-4	https://www.nature.com/articles/s41598-021-03992-4	https://mjl.clarivate.com:/search-results?issn=2045-2322&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

230	**Identifying Central Nodes in Directed and Weighted Networks**	**Kaur, S.**, Gupta, A., and Saxena, R.	Commerce	International Journal of Advanced Computer	2021	107X / 2156	DOI:10.14569/IJACSA.2021.01208100	https://thesai.org/Downloads/Volume12No8/Paper_100-Identifying_Central_Nodes_in_Directed_and_Weighted	https://mjl.clarivate.com:/search-results?issn=2158-107X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
231	**Perception of youth on Digital India**	**Narang, S.,** Singhania, M., Kaur, S., and Mahajan, S.	Commerce	International Journal of Business Innovation	2021	1751-0252	https://doi.org/10.1504/IJBIR.2021.116393	https://www.inderscienceonline.com/doi/abs/10.1504/IJBIR.2021.116393	https://www.scopus.com/sourceid/11200153572	Indexed in UGC Care List and SCOPUS
232	**Intensity quantification of public opinion and emotion analysis on climate change**	Thukral, T., Varshney, A., and **Gaur, V**.	Computer Science	. International Journal of Advanced	2021	2394-5443	DOI:10.19101/IJATEE.2021.874417	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2021/10/7.pdf	https://www.scopus.com/sourceid/21101023180	Indexed in UGC Care List and SCOPUS
233	**A smart learning assistance tool for inclusive education**	Srivastava, S., Varshney, A., Katyal, S., Kaur, R., and **Gaur, V.**	Computer Science	Journal of Intelligent and Fuzzy Systems	2021	1064-1246	https://doi.org/10.3233/JIFS-210075	https://dl.acm.org/doi/abs/10.3233/JIFS-210075	https://www.scopus.com/sourceid/23917	Indexed in UGC Care List and SCOPUS
234	**Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance.**	Dhingra, V., Kumar, S., Chowdhuri, A**.**, and **Garg, A.**	Electronics, Physics	AIP Conference Proceedings	2021	0094-243X	https://doi.org/10.1063/5.0060996	https://aip.scitation.org/doi/abs/10.1063/5.0060996	https://www.scopus.com/sourceid/26916	Indexed in UGC Care List and SCOPUS
235	**Optimal ordering policy for deteriorating items with stock dependent demand, partial backlogging and trade credit period**	Verma, S.K., Rizwanullah, M. and **Singh, C.**	Mathematics	International Journal of Logistics Systems	2021	1742-7967	https://doi.org/10.1504/IJLSM.2021.117709	https://www.inderscienceonline.com/doi/abs/10.1504/IJLSM.2021.117709	https://www.scopus.com/sourceid/4700151504	Indexed in UGC Care List and SCOPUS
236	**A systematic review on the eco-safe management of mosquitoes with diflubenzuron: An effective growth regulatory agent**	Sankar, M. and **Kumar, S.**	Zoology	Acta Ecologica Sinica	2021	1000-0933	https://doi.org/10.1016/j.chnaes.2021.09.019	https://www.sciencedirect.com/science/article/pii/S1872203221001244	https://mjl.clarivate.com:/search-results?issn=1000-0933&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
237	**Indigenous plants demonstrating effective antioxidant properties**	Yadav, K. S., Samal, R. R., Sahgal, A. and **Kumar, S**.	Zoology	Biology Bulletin	2021	3590 / 1608	https://doi.org/10.1134/S1062359022010162	https://link.springer.com/article/10.1134/S1062359022010162	https://mjl.clarivate.com:/search-results?issn=1062-3590&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

238	**Formulation of Clitoriaternatea leaves-mediated silver nanoparticles to control Aedes aegypti larvae**	Lall, Y., **Samal, R. R.**, Sagar, S. K. and Kumar, S.	Zoology	Journal of Communicable Diseases	2021	5138 / 2581	https://doi.org/10.24321/0019.5138.202157	https://medicaladvancedresearchpublications.com/index.php/Journal-CommunicableDiseases/article/view/69	https://mjl.clarivate.com:/search-results?issn=0019-5138&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
239	**In vitro and in silico anticancer potential analysis of Streptomyces sp. extract against human lung cancer cell line, A549**	Kumar, P., Chauhan, A., Kumar, M., Kuanr, B. K., Kundu, A., **Solanki, R.**, and Kapur, M. K	Zoology	3 Biotech	2021	572X / 2190	https://doi.org/10.1007/s13205-021-02812-w	https://link.springer.com/article/10.1007/s13205-021-02812-w	https://mjl.clarivate.com:/search-results?issn=2190-572X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
240	**Sightings of the Tailless Llineblue, Prosotasdubiosa (Insecta: Lepidoptera: Lycaenidae) in Delhi, India**	**Chaudhary, R.** and Maurya, C. B.	Biomedical Science	Bionotes	2021	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2023%20(4)%20December	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2023%20(4)%20December	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science
241	**Sighting of Plain Tiger (Danaus chrysippus, Linn., 1758) form dorippus in New Delhi, India**	**Chaudhary, R.**	Biomedical Science	Bionotes	2021	0972-1800	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2023%20(2%20and%203)/8	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science
242	**Genera of ants associated with larvae of Plains Cupid (Chiladespandava,horsfield, 1829) Iinsecta: Lepidoptera: Lycaenidae) infesting Cycas, in Delhi, India, and**	**Chaudhary, R.** and Kumar, V.	Biomedical Science	Bionotes	2021	0972-1800	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2023%20(2%20and%203)/9	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=tru	Indexed in Web of Science
243	**COVID-19 and cardiovascular disease: Clinical implications of biochemical pathways.**	Varmani, S. G., **Chowhan, R. K.**, Sharma, I., and Narang, R.	Biomedical Science	Journal of the Practice of Cardiovascular	2021	5414 / 2454	10.4103/jpcs.jpcs_21_21	https://journals.lww.com/jpcs/fulltext/2021/07020/covid_19_and_cardiovascular_disease__clinical.2.aspx	https://mjl.clarivate.com:/search-results?issn=2395-5414&hide_exact_match_fl=tru	Indexed in Web of Science
244	**The Dynamical Study of Variable Mass Test Particle in Nonlinear Sense of Restricted 3-body Problem with Heterogeneous Primaries**	**Prasad, S. N.,** Shalini, K., and Ansari, A. A	Mathematics	Application and Applied Mathematics	2021	1932-9466	https://digitalcommons.pvamu.edu/aam/vol16/iss2/28/	https://digitalcommons.pvamu.edu/aam/vol16/iss2/28/	https://mjl.clarivate.com:/search-results?issn=1932-9466&hide_exact_match_fl=tru	Indexed in Web of Science
245	**Development of Dimethylisoxazole-Attached Imidazo [1, 2-a] pyridines as Potent and Selective CBP/P300 Inhibitors.**	Muthengi, A., Wimalasena, V.K., Yosief, H.O., Bikowitz, M.J., Sigua, L.H., Wang,	Biomedical sciences	*Journal of Medicinal Chemistry*	2021	0022-2623	https://doi.org/10.1021/acs.jmedchem.0c02232	https://pubs.acs.org/doi/10.1021/acs.jmedchem.0c02232	https://mjl.clarivate.com:/search-results?issn=0022-2623&hide_exact_match_fl=tru	**SCOPUS INDEXED**

246	**Ex vivo binding studies of the anti-cancer drug noscapine with human hemoglobin: a spectroscopic and molecular docking study.**	Chugh, H., Kumar, P., Kumar, N., Gaur, R. K., **Dhawan, G**., & Chandra, R.	Biomedical sciences	*New Journal of Chemistry*	2021	11440546	https://doi.org/10.1039/D0NJ03334K	https://pubs.rsc.org/en/content/articlelanding/2021/NJ/D0NJ03334K	https://mjl.clarivate.com:/search-results?issn=1144-0546&hide_exact_match_fl=tru	**SCOPUS INDEXED**
247	**Targeting unfolded protein response: a new horizon for disease control**	Khanna, M., Agrawal, N., Chandra, R., & **Dhawan, G**.	Biomedical sciences	Expert Reviews *in Molecular Medicine*	2021		https://doi.org/10.1017/erm.2021.2	https://www.cambridge.org/core/journals/expert-reviews-in-molecular-medicine/article/targeting-unfolded-	https://mjl.clarivate.com:/search-results?issn=1462-3994&hide_exact_match_fl=tru	**SCOPUS INDEXED**
248	**Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices**	**Chowdhuri, A.,** Saraswat, S. and Gupta, C. K.	Physics	Research Journal of Educational Science	2021	2321 - 0508	http://www.isca.me/EDU_SCI/Archive/v9/i1/1.ISCA-RJEduS-2020-003.pdf	http://www.isca.in/EDU_SCI/Archive/v9/i1/1.ISCA-RJEduS-2020-003.php	nil	**PEER REVIEWED**
249	**Pressure Ionization, Polarizability and Screening Constants in Confined Hydrogen Like Ions of Astrophysical Importance**	**Joshi, R.,** Kumar, P., Jha, A. K., and Kumar, T.	Physics	Journal of Atomic, Molecular, Condensed Matter	2021	2582-8215	https://doi.org/10.26713/jamcnp.v8i2.1684	https://www.rgnpublications.com/journals/index.php/jamcnp/article/view/1684	nil	**PEER REVIEWED**
250	**Encompassing environment synthesis, characterization and photovoltaic utilization of cadmium sulphide quantum dots**	Singh, Shruti; Singh, Pramod K; Sharma,Jitender Paul; Kakroo, Sunanda**; Rakesh**	Physics	Materials Today: Proceedings	2021	2214-7853	https://doi.org/10.1016/j.matpr.2020.04.776	https://www.sciencedirect.com/science/article/abs/pii/S2214785320334301	https://www.scopus.com/sourceid/21100370037	**Indexed in UGC Care List and SCOPUS**
251	**Reliable Time Slot Allocation Scheme among Mobile Nodes in MANET**	**C. K. Samal**	Computer science	International Journal of Computer Science	2021	2347-8578	http://www.ijcstjournal.org/volume-9/issue-5/IJCST-V9I5P12.pdf	http://www.ijcstjournal.org/volume-9/issue-5/IJCST-V9I5P12.pdf	nil	**PEER REVIEWED**
252	**Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population**	Arora, G., Taneja, J., Bhardwaj, P., Goyal, S., Naidu, K., Yadav, S. K., Saluja, D. and **Jetly, S**	Biomedical Science	Jounal of Medical Virology	2022	0146-6615 / 1096-9071	i.org/10.1002/j	https://onlinelibrary.wiley.com/doi/10.1002/jmv.27708	https://mjl.clarivate.com:/search-results?issn=0146-6615&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
253	**Association of gender, age, and comorbidities with COVID-19 infection in India**	Yadav, S., Bhardwaj, P., Gupta, P., Saluja, D., **Jetly, S.** and Taneja, J	Biomedical Science	Journal of Integrated Science and Technolog	2022	2321-4635	http://pubs.iscience.in/journal/index.php/jist/article/view/1411/801	http://pubs.iscience.in/journal/index.php/jist/article/view/1411	https://www.scopus.com/sourceid/21101065486	Indexed in SCOPUS

254	**Hesitancy and Acceptance of COVID-19 Vaccination Amidst the Second Wave of Pandemic in India: A General Population Study**	**Jetly, S.,** Bhardwaj, P., Arora, G., Saluja, D., Yadav, S. K., Naidu, K. P. and Taneja, J.	Biomedical Science	Asia Pacific Journal of Public Health	2022	1010-5395 / 1941-2479	10.1177/10105	https://journals.sagepub.com/doi/10.1177/10105395221077062	https://mjl.clarivate.com:/search-results?issn=1010-5395&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
255	**Bioreducible polyethyleneimine core-shell nanostructures as efficient and non-toxic gene and drug delivery vectors.**	Jena, H., Ahmadi, Z., Kumar, P and **Dhawan, G**	Biomedical Science	Bioorganic and Medicinal Chemistry	2022	0968-0896 / 1464-3391	/10.1016/j.bmc	https://www.sciencedirect.com/science/article/abs/pii/S0968089622002784	https://mjl.clarivate.com:/search-results?issn=0968-0896&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
256	**Exploring the role of framework mutations in enabling breadth of a cross-reactive antibody (CR3022) against the SARS-CoV-2 RBD and its variants of concern.**	Saini, S., Agarwal, M., Pradhan, A., Pareek, S., Singh, A. K., **Dhawan, G.,** Dhawan, U, Kumar,	Biomedical Science	Journal of Biomolecular Structure and	2022	0739-1102 / 1538-0254	.1080/0739110	https://www.tandfonline.com/doi/abs/10.1080/07391102.2022.2030800?journalCode=tbsd20	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
257	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., **Gautam, D.**, Sachdeva, S., Dheer, N., Arya, D. K., Gambhir, G. and	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s0028	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
258	**A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions**	**Gambhir, G.**, Gautam, D., Saya, L., Kumar, A., Kumar, S., Singh, A., Singh, S., Chandra,	Chemistry	Asian Journal of Chemistry	2022	2193-5807 / 2193-5815	https://doi.org/10.14233/ajchem.2022.23701	https://asianjournalofchemistry.co.in/user/journal/viewarticle.aspx?ArticleID=34_3_40	https://mjl.clarivate.com:/search-results?issn=2193-5807&hide_exact_match_fl=tru	Indexed in UGC Care List and SCOPUS
259	**A new polysaccharide-based ion-exchange resin for industrial wastewater treatment**	Bargujar, S., Gambhir, G., Raigar, M. B., Hooda, S., Arya, D. K. and **Bhatia, M.**	Chemistry	Polimery	2022	0032-2725	/10.14314/polir	http://polimery.ichp.vot.pl/index.php/p/article/view/1135	https://mjl.clarivate.com:/search-results?issn=0032-2725&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
260	**Assessment of Groundwater Suitability for Drinking and Irrigation in Gurugram Block of Gurugram district, Haryana, India.**	Laxmi, V., Hussain, J., Husain, I., Vadiya, V. K. and **Gambhir, G.**	Chemistry	Asian Journal of Chemistry	2022	0970-7077	https://doi.org/10.14233/ajchem.2022.23779	https://asianjournalofchemistry.co.in/user/journal/viewarticle.aspx?ArticleID=34_6_34	https://www.scopus.com/sourceid/22703	Indexed in UGC Care List and SCOPUS
261	**A DFT Study on Diels-Alder Reaction of Dibenzazepine and 2,5-Dimethylfuran Using Different Solvents and Temperature Conditions.**	Yadav, S., Misra, N., **Khanna, P.**, Mansi, Batra, K., and Khanna, L.	Chemistry	Polycyclic Aromatic Compounds	2022	1040-6638 / 1563-5333	https://doi.org/10.1080/10406638.2022.2056622	https://www.tandfonline.com/doi/full/10.1080/10406638.2022.2056622	https://mjl.clarivate.com:/search-results?issn=1040-6638&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

262	**Chromone functionalized pyridine chemosensor for cupric ions detection.**	Bhalla, P., Tomer, N., **Bhagat, P.**, and Malhotra, R.	Chemistry	Spectrochimica Acta Part A: Molecular and	2022	1386-1425 / 1873-3557	/10.1016/j.saa.	https://www.sciencedirect.com/science/article/abs/pii/S1386142521008568?via%3Dihub	https://mjl.clarivate.com:/search-results?issn=1386-1425&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
263	**Chromone derived effective probe for the detection of metal ion (Cu^{2+}) and chemical explosive (p-nitrotoluene).**	Tomer, N., Goel, A., Bhalla, P., **Bhagat, P.**, and Malhotra, R	Chemistry	Journal of Photochemistry and Photobiology A:	2022	1010-6030 / 1873-2666	1016/j.jphotoch	https://www.sciencedirect.com/science/article/abs/pii/S1010603022000545	https://mjl.clarivate.com:/search-results?issn=1010-6030&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
264	**Wet Chemical Growth of One Dimensional ZnO Film**	Meena, P. L., Kumar, Y., Bhardwaj, P., Genwa, M., **Arya, D. K.**, Verma, A.,	Chemistry	Rasayan Journal of Chemistry	2022	0974-1496	http://rasayanjournal.co.in/admin/php/upload/3482_pdf.pdf	http://rasayanjournal.co.in/admin/php/upload/3482_pdf.pdf	https://www.scopus.com/sourceid/19400157518	Indexed in UGC Care List and SCOPUS
265	**An in-Silico investigation for acyclovir and its derivatives to fight the COVID-19: Molecular docking, DFT calculations, ADME and td-Molecular dynamics simulations,**	Singh, M. B., Jain, P., Tomar, J., Kumar, V., Bahadur, I., **Arya, D. K.**, Sing, P	Chemistry	Journal of the Indian Chemical Society	2022	0019-4522	g/10.1016/j.jics.	https://www.sciencedirect.com/science/article/pii/S0019452222000954	https://mjl.clarivate.com:/search-results?issn=0019-4522&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
266	**II-VI core/shell quantum dots and doping with transition metal ions as a means of tuning the magnetoelectronic properties of CdS/ZnS core/shell QDs: A DFT**	**Malik, P.**, Thareja, R., Singh, J., and Kakkar, R.	Chemistry	Journal of Molecular Graphics and Modelling	2022	1093-3263 / 1873-4243	10.1016/j.jmgm	https://www.sciencedirect.com/science/article/abs/pii/S1093326321002709	https://mjl.clarivate.com:/search-results?issn=1093-3263&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
267	**Precisely engineered type II ZnO-CuS based heterostructure: A visible light driven photocatalyst for efficient mineralization of organic dyes**	**Kaushik, B.**, Yadav, S., Rana, P., Rana, P., Solanki, K., Rawat, D., and Sharma, R. K.	Chemistry	Applied Surface Science	2022	0169-4332 / 1873-5584	.0.1016/j.apsus	https://www.sciencedirect.com/science/article/abs/pii/S0169433222006201	https://mjl.clarivate.com:/search-results?issn=0169-4332&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
268	**Ingeniously designed Silica nanostructures as an exceptional support: Opportunities, potential challenges and future prospects for viable degradation of pesticides**	Sharma, R. K., **Kaushik, B.**, Yadav, S., Rana, P., Rana, P., Solanki, K., and Rawat, D	Chemistry	Journal of Environmental Management	2022	0301-4797 / 1095-8630	0.1016/j.jenvma	https://www.sciencedirect.com/science/article/pii/S0301479721018831#!	https://mjl.clarivate.com:/search-results?issn=0301-4797&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
269	**Magnetically separable type-II semiconductor based ZnO/MoO 3 photocatalyst: a proficient system for heteroarenes arylation and rhodamine B degradation under**	**Kaushik, B.**, Rana, P., Rawat, D., Solanki, K., Yadav, S., and Sharma, R. K.	Chemistry	New Journal of Chemistry	2022	1144-0546 / 1369-9261	https://doi.org/10.1039/D2NJ00906D	https://pubs.rsc.org/en/content/articlelanding/2022/nj/d2nj00906d	https://mjl.clarivate.com:/search-results?issn=1144-0546&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

270	**An Earth-abundant cobalt based photocatalyst: visible light induced direct (het) arene C–H arylation and CO2 capture**	Rana, P., **Kaushik, B.**, Gaur, R., Dutta, S., Yadav, S., Rana, P., Solanki, K., Arora B., Biradar A. V.,	Chemistry	Dalton Transactions	2022	1477-9226 / 1477-9234	https://doi.org/10.1039/D1DT03625D	https://pubs.rsc.org/en/content/articlelanding/2022/DT/D1DT03625D	https://mjl.clarivate.com:/search-results?issn=1477-9226&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
271	**Magnetic Boron Nitride Nanosheets Decorated with Cobalt Nanoparticles as Catalyst for the Synthesis of 3, 4-Dihydropyrimidin-2 (1 H)-ones/thiones.**	Rana, P., Dixit, R., Sharma, S., Dutta, S., Yadav, S., Arora, B., **B. Kaushik**, Rana, P. and	Chemistry	ACS Applied Nano Materials	2022	2574-0970	g/10.1021/acsa	https://pubs.acs.org/doi/10.1021/acsanm.1c04438	https://mjl.clarivate.com:/search-results?issn=2574-0970&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
272	**Unravelling the catalytic potential of a magnetic CoFe 2 O 4/Cu–ABDC MOF composite in the sustainable synthesis of 2 H-indazole motifs.**	Yadav, S., Dixit, R., Sharma, S., Dutta, S., Arora, B., Rana, P., **Kaushik, B.**, Solanki, K. and	Chemistry	New Journal of Chemistry	2022	1144-0546 / 1369-9261	https://doi.org/10.1039/D2NJ01490D	https://pubs.rsc.org/en/content/articlelanding/2022/nj/d2nj01490d/unauth	https://mjl.clarivate.com:/search-results?issn=1144-0546&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
273	**Functionalized MCM-41: Versatile Catalysts for Organic Transformations**	Pasricha, S., Gahlot, P., **Mittal, K.**, Rai, D., Avasthi, N., Kaur, H., and Rai, S.	Chemistry	Chemistry Select	2022	2365-6549	https://doi.org/10.1002/slct.202103674	https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/slct.202103674	https://mjl.clarivate.com:/search-results?issn=2365-6549&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
274	**Coupling Fear and Contagion for Modeling Epidemic Dynamics**	Jain K., Bhatnagar V, Prasad S. and **Kaur S.**	Commerce	IEEE Transactions on Network Science	2022	2327-4697	109/TNSE.2022	https://ieeexplore.ieee.org/document/9813421	https://mjl.clarivate.com:/search-results?issn=2327-4697&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
275	**Behaviour of motion of infinitesimal variable mass oblate body in the generalized perturbed circular restricted three-body problem**	Ansari, A. A., **Narain, L.,** Prasad, S. N., and Alam, M.	Mathematics	Italian Journal of Pure and Applied M	2022	1126-8042 / 2239-0227	https://ijpam.uniud.it/online_issue/202247/15%20Ansari-Narain-Prasad-	https://ijpam.uniud.it/online_issue/202247/15%20Ansari-Narain-Prasad-Alam.pdf	https://mjl.clarivate.com:/search-results?issn=1126-8042&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
276	**Study and prediction of prostate cancer using fuzzy inference system**	Boadh, R., **Aarya, D. D.**, Dahiya, M., Rathee, S., Kumar, A., Jain, S., Rajoria, Y. K. and Rani, S.	Mathematics	Materials Today: Proceedings	2022	2214-7853	/10.1016/j.matp	https://www.sciencedirect.com/science/article/pii/S2214785322000669#:~:text=It%20has%20been%20clearly%20se	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS
277	**Selling price, time dependent demand and variable holding cost inventory model with two storage facilities.**	**Aarya, D. D.**, Rajoria, Y. K., Gupta, N., Raghav, Y. S., Rathee, R., Boadh, R., and	Mathematics	Materials Today: Proceedings	2022	2214-7854	/10.1016/j.matp	https://www.sciencedirect.com/science/article/pii/S2214785322001390	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS

278	**Two Ware-Houses Fuzzy Inventory Model For Deteriorating Items With Ramp Type Demand And Shortages**	Sethi, G., Yadav, A.S. and **Singh, C.**	Mathematics	Journal of Management Information and	2022	1524-7252	10.5120/19994-	https://www.abacademies.org/articles/two-warehouses-fuzzy-inventory-model-for-deteriorating-items-	https://www.scopus.com/sourceid/21100805732	Indexed in UGC Care List and SCOPUS
279	**Smart materials for cardiovascular devices**	**Bhatia M.**, Bhatia S. and Siddhartha.	Physics	Materials Today: Proceedings	2022	2214-7853	/10.1016/j.matp	https://www.sciencedirect.com/science/article/pii/S2214785322001237	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS
280	**Studies on Energy Storage properties of BFO/WO3 bilayer thin film capacitor.**	Lamichhane, S., Sharma, S., Tomar, M., and **Chowdhuri, A**	Physics	Energy Storage	2022	2578-4862	pi.org/10.1002/	https://onlinelibrary.wiley.com/doi/abs/10.1002/est2.342	https://mjl.clarivate.com:/search-results?issn=2578-4862&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
281	**Double quantum ionization cross-sections for more general exponential cosine screened coulomb potential**	**Joshi, R.**	Physics	Spectroscopy Letters	2022	0038-7010 / 1532-2289	https://doi.org/10.1080/00387010.2022.2088559	https://www.tandfonline.com/doi/full/10.1080/00387010.2022.2088559	https://mjl.clarivate.com:/search-results?issn=0038-7010&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
282	**Micrometre double-quantum ionization of Rydberg hydrogen using linearly and circularly polarized light**	**Joshi, R.**	Physics	The European Physical Journal D	2022	1434-6060 / 1434-6079	https://doi.org/10.1140/epjd/s10053-022-00366-x	https://link.springer.com/article/10.1140/epjd/s10053-022-00366-x	https://mjl.clarivate.com:/search-results?issn=1434-6060&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
283	**High harmonic generation spectra for lithium embedded in plasma environment**	**Joshi, R.**	Physics	Spectroscopy Letters	2022	0038-7010 / 1532-2289	https://doi.org/10.1080/00387010.2022.2046104	https://www.tandfonline.com/doi/full/10.1080/00387010.2022.2046104	https://mjl.clarivate.com:/search-results?issn=0038-7010&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
284	**A numerical evaluation of Shannon entropy for modified Hulthen potential**	Dabas, S., and **Joshi, R.**	Physics	The European Physical Journal D	2022	1434-6060 / 1434-6079	https://doi.org/10.1140/epjd/s10053-022-00421-7	https://link.springer.com/article/10.1140/epjd/s10053-022-00421-7	https://mjl.clarivate.com:/search-results?issn=1434-6060&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
285	**Favourable tuning of optical absorbance, bandgap and surface roughness of ZnO thin films by C ion implantation at the critical angle**	Hariwal, R. V., Malik, H. K., **Negi, A.**, and Asokan, K.	Physics	Applied Surface Science Advances	2022	2666-5239	.0.1016/j.apsac	https://www.sciencedirect.com/science/article/pii/S2666523921001355	https://mjl.clarivate.com:/search-results?issn=2666-5239&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science

286	**Unravelling impacts of C ion implantations at polar angles in the physical properties of ZnO nanostructured thin films**	Hariwal, R. V., Malik, H. K., **Negi, A.**, and Asokan, K.	Physics	Materials Letters	2022	0167-577X / 1873-4979	10.1016/j.matle	https://www.sciencedirect.com/science/article/abs/pii/S0167577X2101898X	https://mjl.clarivate.com:/search-results?issn=0167-577X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
287	**Spatiotemporal nonlinear evolution of the laser pulse and turbulence generation in laser produced plasmas.**	Singh, I., **Gupta, P. K.**, Uma, R. and Sharma, R. P.	Physics	Physics of Plasmas	2022	1070-664X / 1089-7674	i.org/10.1063/5	https://aip.scitation.org/doi/abs/10.1063/5.0085724	https://mjl.clarivate.com:/search-results?issn=1070-664X&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
288	**Effect of Ag doping on structural, morphological and optical properties of CdO nanostructured thin films.**	Khan Z. R., Alshammari A. S., Shkir Md., Bouzidi M., Mohamed M., Kumar M., **Sonker**	Physics	Physica B: Condensed Matter	2022	0921-4526 / 1873-2135	10.1016/j.physl	https://www.sciencedirect.com/science/article/abs/pii/S0921452622001016	https://mjl.clarivate.com:/search-results?issn=0921-4526&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
289	**Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, Aedes aegypti L**	**Samal, R. R.**, Panmei, K., Lanbiliu, P. and Kumar, S	Zoology	Bulletin of Entomological Research	2022	0007-4853 / 1475-2670	doi:10.1017/S0007485321001140	https://www.cambridge.org/core/journals/bulletin-of-entomological-research/article/reversion-of-cyp450-	https://mjl.clarivate.com:/search-results?issn=0007-4853&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
290	**Attractive sugar bait formulation for development of Attractive Toxic Sugar Bait for control of Aedes aegypti (Linnaeus).**	**Kumar, S.** Sharma, A. Samal, R. R., Kumar, M., Verma, V., Sagar, R. K., Singh S. P. and	Zoology	Journal of Tropical Medicine	2022	1687-9686 / 1687-9694	rg/10.1155/202	https://www.hindawi.com/journals/jtm/2022/2977454/	https://mjl.clarivate.com:/search-results?issn=1687-9686&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
291	**Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in freshwater ciliate Euplotes aediculatus**	Somasundaram, S., Abraham, J. S., Maurya, **S., Toteja, R.**, Gupta, R., and Makhija, S.	Zoology	Ecotoxicology	2022	0963-9292 / 1573-3017	10.1007/s1064	https://link.springer.com/article/10.1007/s10646-021-02518-y	https://mjl.clarivate.com:/search-results?issn=0963-9292&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
292	**Microbial Journey: Mount Everest to Mars**	Sood, U., Dhingra, G. G., Anand, S., Hira, P., Kumar, R., Kaur, J., Verma, M., Singhvi, N., Lal, S.,	Zoology	Indian Journal of Microbiology	2022	0046-8991 / 0973-7715	10.1007/s1208	https://link.springer.com/article/10.1007/s12088-022-01029-6	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science
293	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the Landfill and the Soil from the Human**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R., **Makhija, S.,** Bhagat,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S1064	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=tru	Indexed in UGC Care List, SCOPUS and Web of Science

294	**The Role of Nanotechnology in Antiviral Regime: An Overview**	Singh, R., **Gupta, S.** and Kumar, P.	Chemistry	Nano Life	2022	1793-9844 / 1793-9852	10.1142/S1793	https://www.worldscientific.com/doi/abs/10.1142/S1793984421300119	https://mjl.clarivate.com:/search-results?issn=1793-9844&hide_exact_match_fl=tru	Indexed in UGC Care List and Web of Science
295	**Identification of perturbed pathways rendering susceptibility to tuberculosis in type 2 diabetes mellitus patients using BioNSi simulation of integrated networks**	Rani, J.; Bhargav, A.; Seth, S.; Datta, M.; **Bajpai, U.**; Ramachnadran, S.	Biomedical Sciences	J Biosci 47:69.	2022	6991 / 097	https://doi.org/10.1007/s12038-022-00309-z	ias.ac.in/article/fulltext/jbsc/047/0069	https://mjl.clarivate.com:/search-results?issn=0250-5991&hide_exact_match_fl=tru	**SCOPUS INDEXED**
296	**Pharmacological Manipulation of UPR: Potential Antiviral Strategy Against Chikungunya Virus.**	Agrawal, N.; Saini, S.; Khanna, M**.; Dhawan, G.;** Dhawan, U.	Biomedical Sciences	Indian Journal of Microbiology	2022	0255-0857 / 1998-3646	https://doi.org/10.1007/s12088-022-01046-5	https://pubmed.ncbi.nlm.nih.gov/36458214/	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=tru	**Indexed in UGC Care List, SCOPUS and Web of Science**
297	**Realizing the New Reality: Machine Learning Curbing Antimicrobial Resistance in Cutibacterium acnes.**	Gupta, R.**; Dhawan, G.;** Kumar, B.; Gautam, H. K.	Biomedical Sciences	Research Journal of Biotechnology, 17, 165-170.	2022	2588-9834 / 2588-9842	https://doi.org/10.25303/1712rjbt1650170	-	https://mjl.clarivate.com:/search-results?issn=2278-4535&hide_exact_match_fl=tru	**SCOPUS INDEXED**
298	**Upsurge in biomedical waste due to COVID-19 in India: A statistical correlation, challenges and recommendations.**	**Khosla, R.;** Jha, A.; Dua, S.; Vermani, S. G.; Rajput, N.; Pani, B**.**	Biomedical Sciences	Frontiers in Environmental Science	2022	2296-665X	https://doi.org/10.3389/fenvs.2022.1022098	https://www.readcube.com/articles/10.3389/fenvs.2022.1022098	https://mjl.clarivate.com:/search-results?issn=2296-665X&hide_exact_match_fl=tru	**SCOPUS INDEXED**
299	**Evaluation of stigma receptivity and its properties in Helianthus annuus L. (Asteraceae).**	Sharma, B**.; Kalra, G.;** Verma, H.	Botany	Vegetos	2022	0970-4078	https://doi.org/10.1007/s42535-022-00419-x	https://link.springer.com/article/10.1007/s42535-022-00419-x	https://www.scopus.com/sourceid/19400157312	**SCOPUS INDEXED**
300	**Hydrotrope assisted green synthesis of dicoumarols and in silico and in vitro antibacterial, antioxidant and xanthine oxidase inhibition studies.**	Mansi**, Khanna, P.;** Gupta, D.; Yadav, S.; Khanna, L.	Chemistry	Journal of Biomolecular structure and	2022	1102 / 153	https://doi.org/10.1080/07391102.2022.2145368	https://pubmed.ncbi.nlm.nih.gov/36373290/	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=tru	**SCOPUS INDEXED**
301	**An understanding of coronavirus and exploring the molecular dynamics simulations to find promising candidates against the Mpro of nCoV to combat the**	Singh, M. B.; Sharma, R.; Kumar, D.**; Khanna, P.;** Mansi; Khanna, L.; Kumar, V.; Kumari,	Chemistry	Journal of Infection and Public Health, 15, 1326–134	2022	0341 / 187	https://doi.org/10.1016/j.jiph.2022.10.013	https://pubmed.ncbi.nlm.nih.gov/36288640/	https://mjl.clarivate.com:/search-results?issn=1876-0341&hide_exact_match_fl=tru	**SCOPUS INDEXED**

302	**UHPLC Analysis of Polycyclic aromatic hydrocarbons (PAH) compounds from the soil by QuEChERS AOAC method from Manesar industrial area, Haryana.**	Singh, N.; Rani, P.; Tandon, N.**; Arya, D. K.;** Mahato, A.	Chemistry	J Microbiol Biotech Food Sci, 12(2)	2022	1338-5178	https://doi.org/10.55251/jmbfs.5861	https://office2.jmbfs.org/index.php/JMBFS/article/view/5861/3282	https://mjl.clarivate.com:/search-results?issn=1338-5178&hide_exact_match_fl=tru	**SCOPUS INDEXED**
303	**Multicomponent synthetic strategies and perspectives for synthesis of linked or fused coumarin heterocycles.**	Pasricha, S.**; Mittal, K.;** Gahlot, P.; Kaur, H.; Avasthi, N.; Shweta	Chemistry	Journal of the Iranian Chemical Society, 19:4035–4	2022	1735-207X / 1735-2428	https://doi.org/10.1007/s13738-022-02603-x	https://link.springer.com/article/10.1007/s13738-022-02603-x	https://mjl.clarivate.com:/search-results?issn=1735-207X&hide_exact_match_fl=tru	**SCOPUS INDEXED**
304	**Entropy for item inclination in sub-community based recommender system.**	Ahuja, H.; Narang**, S,; Kaur, S.**; Saxena, R.	Electronics	International Journal of Advanced Technolog	2022	2215-0986	http://dx.doi.org/10.19101/IJATEE.2021.875768	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2022/8/4.pdf	https://mjl.clarivate.com:/search-results?issn=2215-0986&hide_exact_match_fl=tru	**SCOPUS INDEXED**
305	**Evaluation of Cost benefit Analysis using One-R Supervised Machine Learning Algorithm for Healthcare, https://doi.org/10.14754/nq.2022.20.9.NQ44773**	Kavitha, S**,;** Prasad, N.S.**; Samal, C. K.;** Hanumanthappa, H.	Computer Science	Neuro Quantology, 20(9) 6610-6615,	2022	1303 5150	https://doi.org/10.14754/nq.2022.20.9.NQ44773	https://www.neuroquantology.com/open-access/Evaluation+of+Cost+benefit+Analysis+using+One-		**SCOPUS INDEXED**
306	**Mildly reduced graphene oxide membranes for water purification applications.**	Kumar, S.; Garg, A.; **Chowdhuri, A.**	Physics	Nano Express 3, 045003.	2022	2632-959X	https://doi.org/10.1088/2632-959X/aca7d6	https://iopscience.iop.org/article/10.1088/2632-959X/aca7d6/pdf	https://mjl.clarivate.com:/search-results?issn=2632-959X&hide_exact_match_fl=tru	**SCOPUS INDEXED**
307	**An Inclusive Science Laboratory for Visually Impaired Students.**	**Ghai, G.;** Raj, R.; Kaur, R.	Electronics	Journal of Engineering Education Transform	2022	73, eISSN 2	https://doi.org/10.16920/jeet/2022/v36i2/22157	file:///C:/Users/praga/Downloads/JEET_v36i2_October_2022%20-88-101.pdf	https://www.scopus.com/sourceid/21100890669	**SCOPUS INDEXED**
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309	**Perturbed Robe's problem with charged bodies.**	Ansari, A. A.; Sahdev, S. K.; Kellil, R.**; Prasad, S. N.**	Mathematics	Romanian Astron. J. , 32(2), 83–94.	2022	5168 / 2285	http://www.astro.ro/~roaj/32_2/2022_02_01.pdf	http://www.astro.ro/~roaj/32_2/2022_02_01.pdf	https://mjl.clarivate.com:/search-results?issn=1220-5168&hide_exact_match_fl=tru	**SCOPUS INDEXED**

310	**Behaviour of a variable mass infinitesimal body in the CR3BP with heterogeneous primary and finite straight segment secondary.**	Ansari, A. A.**; Yadav, B.**	Mathematics	Romanian Astron. J. 32(2), 113–125	2022	5168 / 2285	https://ui.adsabs.harvard.edu/abs/2022RoAJ...32..113A/abstract	https://ui.adsabs.harvard.edu/abs/2022RoAJ...32..113A/abstract	https://mjl.clarivate.com:/search-results?issn=1220-5168&hide_exact_match_fl=true	**SCOPUS INDEXED**
311	**Effects of Mass Variation in the Collinear Perturbed Moulton-Copenhagen Configuration.**	Ansari, A. A.**; Yadav, B.**	Mathematics	International Journal of Analysis and Applicatio	2022	2291-8639	https://doi.org/10.28924/2291-8639-20-2022-44	https://etamaths.com/index.php/ijaa/article/view/2619	https://mjl.clarivate.com:/search-results?issn=2291-8639&hide_exact_match_fl=true	**SCOPUS INDEXED**
312	**The Implementation of the Pentagonal Fuzzy Number toward the Solution of the Fuzzy Inventory Model with Ramp Demand Function and Three Parameters**	**Arya, D. D.;** Prakash, S.; Boadh, R.; Chauhan, A.; Rajoria, Y. K.	Mathematics	Neuroquantology, 20(17), 115-124.	2022	1303 5150	https://doi.org/10.14704/Nq.2022.20.17.Nq88017	https://www.researchgate.net/publication/365712215_The_Implementation_of_the_Pentagonal_Fuzzy_Number_towar	–	**PEER REVIEWED**
313	**Optimal strategy for remanufacturing system of sustainable products with trade credit under uncertain scenario.**	Poswal, P.; Chauhan, A.**; Arya, D. D.**; Boadh, R.; Rajoria, Y. K.; Gaiola, S. U.	Mathematics	Materials Today: Proceedings, 69(2), 165-173.	2022	2214-7853	https://doi.org/10.1016/j.matpr.2022.08.303	https://www.sciencedirect.com/science/article/abs/pii/S2214785322054803	https://www.scopus.com/sourceid/21100370037	**Indexed in UGC Care List and SCOPUS**
314	**Space Dependent Study of Fast Neutron Spectra and Tritium Production Rate in a Fusion Reactor Blanket of Li_2O.**	**Bhatia, M .;** Gupta, S.	Physics	Indian Journal of Pure & Applied Physics,	2022	0019-5596	https://www.doi.org/10.56042/ijpap.v60i10.65064	https://nopr.niscpr.res.in/bitstream/123456789/60669/1/IJPAP%2060%2810%29%20833-840.pdf	https://www.scopus.com/sourceid/28036	**SCOPUS INDEXED**
315	**Effect of variation in glancing angle deposition on resistive switching property of WO3 thin films for RRAM devices.**	Lamichhane, S.; Sharma, S.; Tomar, M.; **Chowdhuri, A.**	Physics	J. Appl. Phys. 132, 134102.	2022	0021-8979	https://doi.org/10.1063/5.0103236	https://pubs.aip.org/aip/jap/article-abstract/132/13/134102/2837530/Effect-of-variation-in-glancing-angle-	https://www.scopus.com/sourceid/28132	**SCOPUS INDEXED**
316	**Ensemble-based unsupervised machine learning method for membership determination of open clusters using Mahalanobis distance.**	Deb, S.; Baruah, A.**; Kumar S.**	Physics	MNRAS 515, 4685–4701.	2022	0035-8711 / 1365-2966	https://doi.org/10.1093/mnras/stac2116	https://academic.oup.com/mnras/article-abstract/515/4/4685/6653107?redirectedFrom=fulltext	https://mjl.clarivate.com:/search-results?issn=0035-8711&hide_exact_match_fl=true	**Web of Science**
317	**Two-photon Bound to Bound Transitions under Strong Screening Potential.**	**Joshi, R.**	Physics	ıy. J. Plus, 1	2022	2190-5444	https://doi.org/10.1140/epjp/s13360-022-03224-2	https://link.springer.com/article/10.1140/epjp/s13360-022-03224-2	https://mjl.clarivate.com:/search-results?issn=2190-5444&hide_exact_match_fl=true	**Web of Science**

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319	**A novel RP-HPLC method for quantification of cholinesterase activity in human blood: An application for assessing organophosphate and carbamate**	Sinha, S. N.; Ungarala, R.; Kumar, D.; Sangaraju, R.; **Kumar, S.**	Zoology	PLoS ONE 17(12): e0279287.	2022	1932-6203	https://doi.org/10.1371/journal.pone.0279287	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9803206/pdf/pone.0279287.pdf	https://mjl.clarivate.com:/search-results?issn=1932-6203&hide_exact_match_fl=tru	**Web of Science**
320	**Morphological and physiological changes induced by Achyranthes aspera-mediated silver nanocomposites in Aedes aegypti larvae.**	**Sharma, A.;** Mishra, M.; Dagar, V. S.; Kumar, S.	Zoology	Front. Physiol. 13:1031285.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.1031285	https://www.frontiersin.org/articles/10.3389/fphys.2022.1031285/full#:~:text=The%20silver%20nanocomposites%20sy	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=tru	**Web of Science**
321	**Docking-based virtual screening ascertaining β-sitosterol-induced alterations in the Helicoverpa armigera Hübner gut enzymes.**	**Mishra, M.;** Sharma, A.; Dagar, V.S.; Kumar, S.	Zoology	Journal of the Entomological Research	2022	2651-3579	https://doi.org/10.51963/jers.v24i2.2276	https://www.entomol.org/journal/index.php/JERS/article/view/2276	https://mjl.clarivate.com:/search-results?issn=2651-3579&hide_exact_match_fl=tru	**Web of Science**
322	**An overview on non-Apis bees vis-à-vis the exploration of integrated taxonomic approach (Hymenoptera: Apoidea).**	Falswal, J.; Dey, D.; **Kumar, S.**	Zoology	Fragmenta entomologica, 54 (2): 233–246	2022	0429-288X / 2284-4880	DOI: 10.13133/2284-4880/703	https://www.researchgate.net/publication/366325617_An_overview_on_non-Apis_bees_vis-a-vis_the_exploration	https://mjl.clarivate.com:/search-results?issn=0429-288X&hide_exact_match_fl=tru	**Web of Science**
323	**Metabolic detoxification and ace-1 target site mutations associated with acetamiprid resistance in Aedes aegypti L.**	Samal, R. R.; Panmei, K.; Lanbiliu, P.; **Kumar, S.**	Zoology	Front. Physiol. 13:988907.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.988907	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9468370/pdf/fphys-13-988907.pdf	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=tru	**Web of Science**
324	**Evidence of breeding of Jamides Bochus (Stoll, [1782]) (Insecta: Lepidoptera: Lycaenidae) in New Delhi, India**	**Chaudhary, R.;** Kumar, V**.**	Biomedical Science	Bionotes, 24, 252-253.	2022	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2024%203-4/252-253-	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=tru	**Web of Science**
325	**Sighting of Ruddy Meadow Skimmer Neurothemis Intermedia (Rambur 1842) (Insecta: Odonata:Libellulidae) in New Delhi, India**	**Chaudhary, R.**	Biomedical Science	Bionotes, 24, 254-256	2022	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2024%203-4/254-256-	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=tru	**Web of Science**

326	**Ovipositing record of Tailless Lineblue Prosotas Dubiosa , (Semper |1897|) (Insecta: Lepidoptera : Lycaenidae) from the vicinity of Delhi**	**Chaudhary, R.**	Biomedical Science	Bionotes, 24, 260-261	2022	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%2024%203-4/260-261	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=tru	**Web of Science**
327	**Arbuscular mycorrhizal fungi and host plant relationship with respect to heavy metal remediation of soil.**	Gulati. S.; **Narang, A.;** Shukla, A.; Katyal, R.; Mathur, R.; Kaur, J.	Botany	Kavaka, 58(3), 61-74	2022	0379-5179	https://www.doi.org/10.36460/Kavaka/58/3/2022/61-74	https://www.researchgate.net/publication/365431747_Arbuscular_Mycorrhizal_Fungi_and_Host_Plant_relationship	–	**UGC CARE**
328	**Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from Wastewater.**	Saya, L.**; Hooda, S.;** Singh, R. W.	Chemistry	International journal of innovative research	2022	2349-6002	https://ijirt.org/master/publishedpaper/IJIRT157412_PAPER.pdf	https://ijirt.org/master/publishedpaper/IJIRT157412_PAPER.pdf	https://mjl.clarivate.com:/search-results?issn=1996-6814&hide_exact_match_fl=tru	**PEER REVIEWED**
329	**Bibliometric Analysis of Peer-Reviewed Literature on Stress Factors Affecting Agricultural Productivity.**	Sisodia, R.; **Sharma, R.**	Botany	Current Agriculture Research Journal, 10(3), 170-	2022	2347-4688	http://dx.doi.org/10.12944/CARJ.10.3.02	https://www.agriculturejournal.org/volume10number3/bibliometric-analysis-of-peer-reviewed-literature-on-stress-	–	**UGC CARE**
330	**Impact of Covid-19 on Corporate Social Responsibility: A Study of Indian IT Sector.**	**Goel, S. K,**; Jain, S.	Commerce	Journal of Commerce and Management, 9(2),	2022	2347-4440	https://doi.org/10.17492/jpi.manthan.v9i2.922206	https://www.indianjournals.com/ijor.aspx?target=ijor:mjcm&volume=9&issue=2&article=006	–	**PEER REVIEWED**
331	**Phool: Journey from waste to wealth**	**Kaur, S.;** Bhagat, H.; Kaur, P.N	Commerce	Arthavaan, 5, 65-74.	2022	2455-0353	https://www.bharaticollege.du.ac.in/images/media/IM-6509-BC.pdf	–	–	**PEER REVIEWED**
332	**A Simulation-based Approach to Evaluate and Regulate the Reputation Score of a Software Agent in E-Market.**	Kochhar, S. K.; Soni, A.; Srivastava, S.**; Gaur, V.**	Computer Science	International Journal of Next-Generation	2022	0976-5034	https://doi.org/10.47164/ijngc.v13i3.788	https://ijngc.perpetualinnovation.net/index.php/ijngc/article/view/788	–	**PEER REVIEWED**
333	**Study the Effect of Modified Newtonian Force on the Restricted 3-body Configuration in Non-Linear Sense.**	Singh B.; Kumari, S.; **Prasad, S. N.**	Mathematics	Applications and Applied Mathematics: An	2022	1932-9466	https://digitalcommons.pvamu.edu/aam/vol17/iss2/10/	https://digitalcommons.pvamu.edu/aam/vol17/iss2/10/	https://mjl.clarivate.com:/search-results?issn=1932-9466&hide_exact_match_fl=tru	**Web of Science**

334	**Measuring complexity and chaos in three species food chain system with the Beddington-Deangelis functional response.**	**Prasad, S. N.;** Saha, L. M.; Ansari, A. A.	Mathematics	Bulletin of the Allahabad mathematical	2022	0273-0979 / 1088-9485				**PEER REVIEWED**
335	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population.**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; Chauhan, B.; **Misra, M.**; Sharma, B.	Zoology	International Journal of Zoological Investigati	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_Effects_Persisting_Mo	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=tru	**Web of Science**
336	**Re-characterization of Potential Zoonotic Trematode Parasite Parasitizing Intestine of Snakehead Fish, (Channa striata) Utilizing Multiple Sequence Alignment Tools**	Chauhan, B.**; Misra, M.;** Sharma, B.	Zoology	International Journal of Zoological Investigati	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.059	https://www.researchgate.net/publication/364126895_Re-characterization_of_Potential_Zoonotic_Trematode_Para	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=tru	**Web of Science**
337	**Impact of Climatic Change on Respiratory Health.**	Jain, R.; Aryama, P.; **Chauhan, B.;** Misra, M.**;** Saxena, T.	Zoology	International Journal of Zoological Investigati	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.115	https://www.researchgate.net/publication/366684164_Impact_of_climatic_change_on_respiratory_health_Intern#fullTe	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=tru	**Web of Science**
338	**PCR primer design for mitochondrial cox-1 gene from Clinostomum complanatum towards diagnosis.**	**Misra, M.;** Chauhan, B.; Km, D.; Madhuri, A,; Sharma, B.	Zoology	Bioinformation 18(9), 831-833.	2022	0973-2063	https://doi.org/10.6026/97320630018831	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10326325/pdf/9732063001883 1.pdf	–	**PEER REVIEWED**
339	**A Literature Review on Reckless and Hazardous Contraceptive Practices used since Primeval Times.**	**Chauhan, B.; Misra, M.;**	Zoology	Indian Journal of Natural Sciences, 13, 44976-	2022	0976-0997	https://www.researchgate.net/publication/362540479_A_Literature_Review_on_Re	https://www.researchgate.net/publication/362540479_A_Literature_Review_on_Reckless_and_Hazardous_Contracep	https://mjl.clarivate.com:/search-results?issn=0976-0997&hide_exact_match_fl=tru	**Web of Science**
340	**Role of A Evolutionary Conserved Hypothalamic Neuropeptide: Neuropeptide Y (NPY) in Release of Gonadotropin and Anterior Pituitary Hormones in Different**	**Chauhan, B.;** Baweja, V.; Misra, M.;	Zoology	Indian Journal of Natural Sciences, 13, 48415-	2022	0976-0997	https://www.researchgate.net/publication/364310786_Role_of_A_Evolutionary_Con	https://www.researchgate.net/publication/364310786_Role_of_A_Evolutionary_Conserved_Hypothalamic_Neuropept	https://mjl.clarivate.com:/search-results?issn=0976-0997&hide_exact_match_fl=tru	**Web of Science**
341	**Monkeypox: Endemic to Epidemic A review of the current scenario of Monkeypox disease outbreak.**	Thakur, M.; **Bhardwaj, S.**; Singh, J.	Zoology	International Journal for Research Trends	2022	2456-3315	https://ijrti.org/papers/IJRTI2206295.pdf	https://ijrti.org/papers/IJRTI2206295.pdf	https://mjl.clarivate.com:/search-results?issn=2386-4303&hide_exact_match_fl=tru	**Web of Science**

342	**In vitro micropropagation of *Acacia holosericea* a. cunn. ex g. don through cotyledons.**	**Narang, A.**	Botany	Intl. J. Multidisc. Edu. Res, 11(7), 70-75	2022	2277-7881	http://ijmer.in.doi./2022/11.01.135	http://s3-ap-southeast-1.amazonaws.com/ijmer/pdf/volume11/volume11-issue1(7)/15.pdf	–	**PEER REVIEWED**
343	**Axenic propagation of a woody legume - Prosopis cineraria (L.) Duce through cotyledonary node explants**	**Narang, A**. and Shukla, A.	Botany	Intl. J. Multidisc. Edu. Res, 11(2), 16-21	2022	2277-7881	http://ijmer.in.doi./2022/11.02.03	http://s3-ap-southeast-1.amazonaws.com/ijmer/pdf/volume11/volume11-issue2(1)/3.pdf	–	**PEER REVIEWED**
344	**Synthesis, Characterization and Application of Novel Guar Gum-N,N-Dimethylaniline Resin for Waste Water Treatment.**	Raigar, M. B.**, Hooda, S.,** and Bargujar, S.	Chemistry	International Journal of Recent Scientific Research,	2022	0976-3031	10.24327/IJRSR	https://www.recentscientific.com/sites/default/files/17775-A-2021.pdf	–	**PEER REVIEWED**
345	**Linkages Between Credit Cards and Consumers' Impulsive Buying Behavior: An Empirical Analysis.**	Singh, A. K.**, Goel, S. K.,** Shrivastav, R. K., and Chahar, K.	Commerce	Arthshastra Indian Journal of Economics and	2022	2278 - 181	/aijer/2021/v10	https://indianjournalofeconomicsandresearch.com/index.php/aijer/article/view/168221	–	**PEER REVIEWED**
346	**Antibiotic Resistance: A Global Health Crisis**	Solanki, R., Anand, S., Anand, M., Kumar, P., Kumar, M. and **Kapoor, M. K.**	Zoology	Biosphere, 1: 1-70, Pg 3-11.	2022					**PEER REVIEWED**
347	**Role of abiotic and biotic components in remediating environmental pollutants: A review**	Somasundaram, S., Dagar, J., Abraham, J. S., Maurya, S., Sandeep**, Makhija, S,** and Toteja, R.	Zoology	Microsphere, 1: 1-70, Pg 49-60	2022	2583-5327	10.59118/SDBZ7071	https://www.researchgate.net/publication/369178502_Role_of_abiotic_and_biotic_components_in_remediating_envi	–	**PEER REVIEWED**
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From the journal:
Green Chemistry

One-pot and catalyst-free synthesis of pyrroloquinolinediones and quinolinedicarboxylates †

Xiaofeng Zhang ,[a] Gagan Dhawan ,[ab] Alex Muthengi ,[a] Shuai Liu ,[a] Wei Wang ,[c] Marc Legris [a] and Wei Zhang [*a]

Author affiliations

Abstract

A method for the catalyst-free synthesis of pyrroloquinolinediones and quinolinedicarboxylates is developed through a one-pot synthesis involving denitrogenation of azide, benzisoxazole formation, aza-Diels–Alder cycloaddition, and dehydrative aromatization. Only stoichiometric amounts of N_2 and H_2O are produced as by-products. A comprehensive green chemistry metrics analysis indicated that this method is much more efficient and greener than two reported methods for the synthesis of pyrroloquinolinediones.

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A robust replenishment model for deteriorating items considering ramp-type demand and inflation under fuzzy environment

Archana Sharma, Usha Sharma and Chaman Singh

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ABOUT

Abstract

Supply chain performance directly depends on demand pattern, inventory management and control strategies of organisations apart from other supply chain activities. Effective replenishment policy can increase the performance of logistics and supply chain activities and customer satisfaction. Optimal inventory model can also reduce overall replenishment cost and improve financial performance of the organisation. This study focuses on developing a replenishment model for deteriorating products with ramp-type demand rate under the consideration of inflation and partial backlogging. The nature of the demand function is a piecewise exponential function. The proposed model is developed under fuzzy environment, which can easily handle uncertainty and impreciseness associated with parameters. The illustrative numerical example has given in crisp as well as in fuzzy sense to demonstrate the solution procedure for the proposed approach. Sensitivity analysis is also performed to check the robustness of the proposed model.

Keywords

supply chain, inventory model, ramp-type demand rate, inflation, partial backlogging, fuzzy

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Supply Chain Model with Two Storage Facility for Stock Dependent Demand Incorporating Learning and Inflationary Effect under Crisp and Fuzzy Environment

Chaman Singh, Shiv R. Singh

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Abstract

In this paper, a supply chain model with power form stock-dependent demand rate is developed, incorporating the effect of learning and inflationary environment. In order to bring their research closer to reality, all the cost parameters involved in the model are considered fuzzy in nature. The demand rate is assumed to be a polynomial form of current inventory level in Own-warehouse. To display the items, retailer has one warehouse of finite capacity, treated as own warehouse (OW) and may hire another warehouse of large capacity, treated as rented warehouse (RW) to storage the excess inventory. Learning effect is incorporated on retailer's selling price, purchasing cost, part of holding cost, deterioration cost and ordering cost. Proposed model is illustrated with some numerical example along with sensitivity analysis of parameters.

Acta Ecologica Sinica

Volume 38, Issue 5, October 2018, Pages 325-328

Inhibition of gut proteases and development of dengue vector, *Aedes aegypti* by *Allium sativum* protease inhibitor

Tooba Naz Shamsi [a], Romana Parveen [a], Afaque Ahmad [b], Roopa Rani Samal [c], Sarita Kumar [c], Sadaf Fatima [a]

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Abstract

The paper describes the bio efficacy of a protease inhibitor; isolated from *Allium sativum* '*garlic*' (ASPI); against Aedes aegypti mosquito, a well-known transmitter of dengue and Chikungunya. The purification of protease inhibitor from *Allium sativum* '*garlic*' (ASPI) was carried out by ammonium sulfate precipitation followed by Fast Protein Liquid Chromatography using akta DEAE-Cellulose column. The protein fraction demonstrating trypsin inhibitory activity was further evaluated for its insecticidal activity using gut protease inhibition assay and larvicidal assay. ASPI is an inhibitor of porcine trypsin (IC_{50} of 650.726 μg/mL) and has molecular weight of ~15 kDa determined by SDS PAGE similar to other inhibitors of the Kunitz-type family (14–26 kDa). ASPI demonstrated 50% reduced activity of *Ae. aegypti* midgut proteases and showed a dose-dependent acute toxicity on *Ae. aegypti* 3rd instars exhibiting LC_{50} value of ~50.827 μg/mL. After ten days of larval exposure ASPI resulted in a 24-h delay of larval development and ~72% mortality at 61.5 μg/mL. These results suggest that ASPI may serve as potent insecticida

Original Article | Published: 24 June 2017

Assessment of *Achyranthes aspera* induced toxicity and molecular analysis of RAPD-PCR profiles of larval genomic DNA of *Aedes aegypti* L. (Diptera: Culicidae)

Aarti Sharma, Sarita Kumar & Pushplata Tripathi

Journal of Parasitic Diseases **41**, 1066–1073 (2017) | Cite this article

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Abstract

Current studies investigated the anti-mosquito potential of *Achyranthes aspera* against the dengue vector, *Aedes aegypti*. The stems and leaves of *A. aspera* were extracted in hexane and evaluated for their toxicity against early fourth instars of *A. aegypti*. The larvicidal efficacy of the extract was validated as per WHO protocol. The mortality counts were made after 24 h and LC values were calculated at different levels. The adverse impact of extracts was also explored on the larval genomic DNA. The larvae were exposed to extracts at LC_{50} levels and the alterations in *g*-DNA was evaluated through RAPD-PCR technique using three random primers; MA-09, MA-12 and MA-26. Our investigations ascertained the larvicidal efficacy of both the leaf and stem extracts of *A. aspera* resulting in respective LC_{50} values of 0.068 and 0.082 mg/mL. The extracts also caused variable genotoxic effects with significant changes in the RAPD profiles. The results showed appreciable modifications in larval *g*-DNA with loss of certain bands and gain of unique bands with 82.35% DNA polymorphism. These alterations suggest the probable DNA damage and mutations in the larval *g*-DNA caused by certain phytocomponents which could be the possible reason of larval mortality. Our studies evidenced the anti-mosquito potential of *A. aspera* extracts against *A. aegypti* causing appreciable larval mortality and significant changes in *g*-DNA. The *A. aspera* extracts are suggested as efficient and eco-friendly control agent against *A. aegypti*, yet further investigations are needed to identify the bioactive constituent and ascertain its effectiveness in the field conditions.

A facile and rapid method for green synthesis of *Achyranthes aspera* stem extract-mediated silver nano-composites with cidal potential against *Aedes aegypti* L.

Aarti Sharma [a], Sarita Kumar [b], Pushplata Tripathi [a]

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Abstract

Aedes aegypti L. is the primary vector associated with transmission of globally concerned diseases; Zika, yellow fever, dengue and Chikungunya. Present study investigates an efficient, alternative and comparative approach for mosquito control which is safe to environment and non-target organisms. The silver nano-composites (AgNCs) were synthesized from the aqueous stem extract of *Achyranthes aspera* (AASE) using different concentration of aqueous silver nitrate ($AgNO_3$). The synthesis was tracked by UV-vis spectrophotometer and particle size analyser (DLS). The evaluation of their larvicidal potential against early fourth instars of *Ae. aegypti* showed significant potency, the toxicity increasing with the concentration of silver nitrate. The 24, 48 and 72 h bioassays resulted in respective LC_{50} values of 26.693, 1.113 and 0.610 µg/mL (3 mM AASE-$AgNO_3$) 9.119, 0.420 and 0.407 µg/mL (4 mM AASE-$AgNO_3$) and that of 4.283, 0.3 and 0.248 µg/mL (5 mM AASE-$AgNO_3$). Keeping in view the significantly high larvicidal efficiency at lower concentration of silver nitrate, the 4 mM nano-composites were selected over 5 mM composites for further biophysical characterization carried out by X-ray Diffraction (XRD), Fourier transform infrared spectrometer (FTIR), Scanning electron microscopy (SEM), Energy dispersive X-ray (EDX) spectroscopy and Transmission electron microscopy (TEM). SEM and TEM confirmed the synthesis of spherical poly-dispersed AgNCs with average size ranging from 1–30 nm. Characterization through XRD showed the crystalline face-centered-cubic (fcc) structure of AgNCs with the highest intense peak obtained at 2θ value of 31.82°. FT-IR data suggests complex nature of AgNCs showing clearly defined peaks in different ranges. The present investigations recommend AgNCs of *A. aspera* stems as a low-cost and eco-friendly alternative to chemical insecticides for mosquito control.

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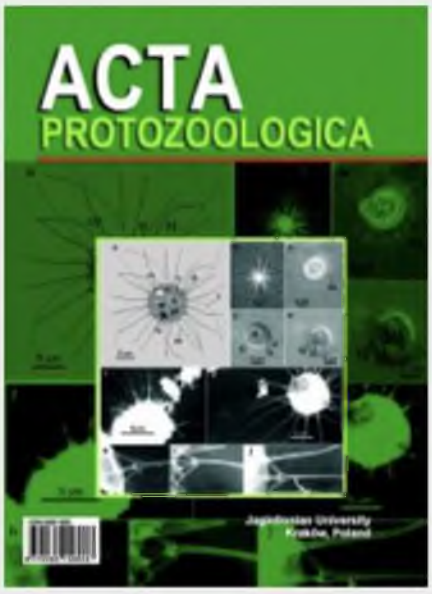

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HAYATI Journal of Biosciences
Volume 24, Issue 4, October 2017, Pages 215-220

Original Research Article

Diversity and Abundance of Ammonia-Oxidizing Bacteria and Archaea in a Freshwater Recirculating Aquaculture System

Cherita Devi Khangembam [1], Jai Gopal Sharma [2], Rina Chakrabarti [1]

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Abstract

The role of ammonia-oxidizing bacteria and archaea was evaluated using *amoA* gene in a freshwater recirculating system. Broken earthen pot pieces (BEP) were used as filter bed material. Five archaeal and four bacterial operational taxonomic units were retrieved from *amoA* genes. Shannon-Weiner and Simpson indices were higher in archaeal *amoA* sequence compared with the bacteria. Subtype diversity ratio and subtype diversity variance were 0.522 and 0.008, respectively, for archaea and 0.403 and 0.015, respectively, for bacteria. In archaea, 50% *amoA* sequences showed 99%–100% similarity with the known sequences of ammonia monooxygenase subunit A of uncultured archaeon clones and thaumarchaeote. In bacteria, 84% sequences showed 99% similarity with *amoA* sequences of different uncultured bacterial clone and Nitrosomonadaceae. Absolute quantification showed that the abundance of archaea was 12-fold higher compared with bacteria. In this recirculating system, ammonia-oxidizing archaea and bacteria played a major role; BEP supported the growth of these ammonia-oxidizing microorganisms.

Journal of Eukaryotic Microbiology / Volume 64, Issue 4 / p. 539-554

Original Article | Open Access

Beyond the "Code": A Guide to the Description and Documentation of Biodiversity in Ciliated Protists (Alveolata, Ciliophora)

Alan Warren, David J. Patterson, Micah Dunthorn, John C. Clamp, Undine E.M. Achilles-Day, Erna Aescht, Saleh A. Al-Farraj, Saleh Al-Quraishy, Khaled Al-Rasheid, Martin Carr, John G. Day ... See all authors

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Affiliations are listed at the end.

Abstract

Recent advances in molecular technology have revolutionized research on all aspects of the biology of organisms, including ciliates, and created unprecedented opportunities for pursuing a more integrative approach to investigations of biodiversity. However, this goal is complicated by large gaps and inconsistencies that still exist in the foundation of basic information about biodiversity of ciliates. The present paper reviews issues relating to the taxonomy of ciliates and presents specific recommendations for best practice in the observation and documentation of their biodiversity. This effort stems from a workshop that explored ways to implement six Grand Challenges proposed by the International Research Coordination Network for Biodiversity of Ciliates (IRCN-BC). As part of its commitment to strengthening the knowledge base that supports research on biodiversity of ciliates, the IRCN-BC proposes to populate *The Ciliate Guide*, an online database, with biodiversity-related data and metadata to create a resource that will facilitate accurate taxonomic identifications and promote sharing of data.

THE nomenclature of ciliates and other heterotrophic protists (sensu Adl et al. 2012) is governed by the International Code of Zoological Nomenclature ("the Code") that provides rules for naming taxa up to the level of family (ICZN 1999). The Code regulates nomenclatural issues, and it also establishes minimal standards for documenting newly described species. These are deliberately general and suited more to the study of animals than protists. In particular, the rule to deposit type specimens in permanently curated repositories (ICZN 1999, Art. 16.4.2 and Art. 75.3.7) has, over time, generated a database of material that not only has fixed names but also has formed the nucleus of large museum collections. These collections provide a wealth of information about the variability and biogeography of species and represent a potential source of DNA for investigations of molecular phylogenetics.

For ciliates and many other protists, the logistical difficulties imposed by their small size meant there was no convention for depositing type specimens until the latter part of the 20th century, when deposition of permanently stained preparations or other physical specimens (e.g. on SEM stubs) began to be required as type material for taxonomic descriptions or redescriptions. In addition, new methods of visualizing morphology and sequencing genes have been introduced over the last several decades, but there are no formal standards for application of these methods to taxonomic identifications or descriptions of ciliates, despite recent recommendations (Aescht 2001, 2008; Foissner 2002; ICZN 1999; Lynn and Simpson

Assessment of heavy metal toxicity in four species of freshwater ciliates (Spirotrichea: Ciliophora) from Delhi, India

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In vitro **laboratory experiments were conducted to determine the toxicity (per cent survival and LC_{50}) of essential and non-essential heavy metals (cadmium, copper, nickel, lead and zinc) in four spirotrich ciliates: *Euplotes* sp., *Notohymena* sp., *Pseudourostyla* sp. and *Tetmemena* sp. isolated from three different freshwater ecosystems in the Delhi region, India. The toxicity of the heavy metals was found to vary among the different ciliates. Copper was most toxic (24 h-LC_{50} value ranged between 0.125 and 0.74 mg/l) and zinc was least toxic (24 h LC_{50} value ranged between 46.98 and 144.32 mg/l) to each of the ciliates. Of the four ciliates, *Notohymena* sp. had the highest tolerance limit to three heavy metals (Cu, Cd and Pb) out of the five tested. This study shows the high potentiality of using freshwater ciliates for monitoring the intensity and potency of ecological damage caused by heavy metals in aquatic ecosystems.**

Keywords: Ciliates, freshwater, heavy metals, toxicity.

THERE is a global increase in the concentration of heavy metals in the environment mainly due to anthropogenic activities and India is no exception to this[1]. Although some heavy metals are essential micronutrients, all may be toxic if present in sufficiently high concentration in a bioavailable form, mainly as a result of metabolic interference and mutagenesis. The presence of heavy metals in aquatic environments is a major concern because of their threat to plant and animal life, thus disturbing the natural ecological balance[2]. Many freshwater ecosystems, including lakes, ponds, rivers and reservoirs are exposed to heavy metal contamination from a range of sources, primarily wastewater discharges from industry and households[3,4]. Most of the heavy metals have a long half-life and cannot be degraded, but may instead bio-accumulate throughout the food chain leading to physiological stress causing ecological disturbance[5–7].

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Toxicity of various heavy metals can be studied using ciliated protists[8–10]. These eukaryotic microorganisms are found in a variety of trophic niches, have generation time of 3–7 h and many are easy to culture *in vitro*[11]. Ciliates share a higher degree of functional and genetic similarities with humans than bacteria or yeast (microbial eukaryotic model organism)[12–14]. All these properties make them suitable candidates both for eco-toxicological studies and for monitoring water quality[15–17].

In the present study, we assess the toxicity of essential (Cu and Zn) and non-essential (Cd, Ni and Pb) heavy metals on ciliated protists isolated from three different freshwater ecosystems (river, lake and pond) in the Delhi region, India. The diversity of free-living ciliates in the study sites was observed for a period of one year. The most frequently encountered ciliate species were from four genera, namely *Euplotes*, *Notohymena*, *Pseudourostyla* and *Tetmemena* (Figure 1) and all were easily cultured under laboratory conditions. Toxicity assays were carried out *in vitro* in order to determine the sensitivity and survival of *Euplotes* sp., *Notohymena* sp., *Pseudourostyla* sp. and *Tetmemena* sp. to different doses of heavy metals.

Materials and methods

Study area

Delhi is located in northern India. It is bordered by the states of Haryana to the north, west and south, and Uttar Pradesh (UP) to the east. Prominent features of the geography of Delhi include the floodplains of River Yamuna. In the present study three sites were selected in different ecological regions of Delhi.

Site 1: Okhla Bird Sanctuary (28.5700°N, 77.3023°E): This is a bird sanctuary at the Okhla Barrage over the Yamuna. The site is located at the point where the river exits Delhi and enters UP. The most prominent feature of the sanctuary is the large lake created by a dam over the

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Influence of copper and cadmium toxicity on antioxidant enzyme activity in freshwater ciliates

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Though metals are biologically important, increase in the threshold concentration of heavy metal in the environment may interfere with the metabolic activity of organisms. Heavy metal stress induces production of reactive oxygen species (ROS) *viz.* hydroxyl radical, superoxide radical or hydrogen peroxide (H_2O_2). Various antioxidant enzymes such as superoxide dismutase, ascorbate peroxidase, catalase, glutathione peroxidase and peroxiredoxin of SOD-ascorbate-glutathione cycle get activated during such stress. These enzymes are involved in ROS detoxification , and thereby protect the cells from oxidative stress. In this study, we explored activity of the antioxidant enzyme, superoxide dismutase (SOD) in the presence of heavy metals i.e., Cu and Cd in three freshwater ciliates, *Tetmemena* sp., *Notohymena* sp. and *Euplotes* sp. Heavy metals negatively affected the population growth of chosen ciliates which was measured as 24 h-LC_{50}. The 24 h-LC_{50} doses of Cu and Cd, respectively were 0.14 and 2.44 mg/L for *Tetmemena* sp.; 0.74 and 5.06 mg/L for *Notohymena* sp.; and 0.17 and 2.24 mg/L for *Euplotes* sp. The levels of SOD were found to be significantly higher in the presence of Cu and Cd. Interestingly, exposure with Cu increased the SOD level at LC_{30} and LC_{50} doses, however, at higher concentration of Cu (i.e., LC_{70} dose), SOD level decreased. The results suggest that SOD may be used as an effective enzymatic biomarker to evaluate the toxic effects of heavy metals in the ciliate species.

Keywords: *Euplotes* sp., Heavy metal stress, *Notohymena*, Oxidative stress, ROS, SOD, Spirotrich ciliates, *Tetmemena* sp.

Heavy metals increase reactive oxygen species (ROS) production and eventually induce oxidative stress in both aquatic and terrestrial organisms[1-6]. Heavy metals with redox activity (Fe, Cu) are directly involved in ROS production by Fenton/Haber-Weiss reaction or by autoxidation. Also, metals with non-redox activity (Cd, Zn, Hg) can produce ROS indirectly by blocking the cellular antioxidant defenses[7,8]. ROS (such as superoxide radicals, hydrogen peroxides and hydroxyl ions) are involved in various pathological processes including lipid peroxidation[9,10]. These radicals cause much of the tissue damage resulting from inflammation and can eventually induce cell death by apoptosis/ necrosis[10,11]. Cells under oxidative stress show various dysfunctions due to significant changes caused by ROS on proteins, DNA and cellular lipids[2,11]. Various anti-oxidant enzymes (such as superoxide dismutase, ascorbate peroxidase, catalase glutathione peroxidase and peroxiredoxin) are known to be involved in ROS detoxification (Fig. 1) and in protecting the cells from oxidative stress[7,12].

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Superoxide dismutase (SOD), which gets activated in response to oxidative stress at first, plays a major role in catalyzing the dismutation of superoxide anion ($O_2^{\cdot-}$) into O_2 and H_2O_2[13,14]. SOD exists in several isoforms including cytosolic copper-zinc SOD (SOD-1), mitochondrial manganese SOD (SOD-2)[15] and extracellular/chloroplast iron SOD (SOD-3)[14,16].

A major hydrogen peroxide (H_2O_2) detoxifying system in the cells is ascorbate-glutathione cycle, where ascorbate peroxidase (APx) plays a key role in catalyzing H_2O_2 into H_2O using ascorbate as a specific electron donor[12]. GSH is a tripeptide (L-γ-glutamyl-L-cysteinylglycine) synthesized in two consecutive steps catalyzed by γ-glutamyl-cysteine synthase and glutathione synthetase[17]. GSH also acts as substrate for glutathione peroxidase (GPx) to catalyze hydrogen peroxide[7]. Changes in these antioxidant enzymes including ASC-GSH cycle enzymes have been observed in various organisms exposed to different abiotic stress including heavy metals. Overexpression of any of these enzymes by a particular organism has shown higher resistance to the abiotic stress as compared to the organisms under-expressing these enzymes[18,19]. Studies on heavy metal induced oxidative stress and generation of ROS have

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Assessment of particulate matter (PM) concentrations at a typical construction site in Bangalore, India

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Int. Res. J. Environment Sci., **Volume 6, Issue (2),** Pages 14-18, February,22 **(2017)**

Abstract
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Abstract

Construction sites pose a major challenge to the environment due to presence of different types of particulate matter (PM). Concentration of particulate matter is a typical indicator for urban air quality. Although it has long been recognised that construction activities are a pertinent source of PM emissions, not much research has gone in this direction. The investigation envisages quantification of the PM emissions at a construction site for particulates having varying aerodynamic diametersfine particles 2.5 &

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Sensors and Actuators B: Chemical

Volume 238, January 2017, Pages 83-90

Distinct detection of liquor ammonia by ZnO/SAW sensor: Study of complete sensing mechanism

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Abstract

ZnO/SAW sensor was reported to give distinct response towards liquor ammonia. To study the complete mechanism, ZnO thin films (40 nm) were deposited using rf sputtering in different reactive gas composition of argon and oxygen. The increase in oxygen content (30–100%) during film growth leads to decrease in the value of stress and bond energy. The individual contribution of different SAW sensing mechanisms such as mass loading, elastic effects and acousto-electric interaction, was evaluated and analyzed to understand the distinct response for liquor ammonia. It was found that mass loading seems to get affected by the presence of stress whereas elastic loading was affected by the crystallite size and bond energy (Zn—O) in ZnO thin films.

Sensitivity Enhancement Studies of SAW Vapor Sensor by Oscillator Tuning Using Varactor Diode

Publisher: IEEE

Harpreet Singh ; Yashoda Parmar ; V. Bhasker Raj ; Haresh M. P... **All Authors**

Abstract:

This paper reports the designing of surface acoustic wave (SAW) oscillator with varactor diode (or varicap) as a part of tuning element. A practical way to enhance sensitivity of SAW sensor oscillator is performed by tuning capacitance using varicap. The varactor diode is placed at three different locations of the oscillator circuit to realize three different configurations. The change in frequency with applied voltage to varactor diode is studied for all three configurations. Sensitivity study for the three configurations is carried out with di-methyl methyl phosphonate vapor. The sensitivity, stability, and noise of each configuration are analyzed. Using varicap, about six times enhancement in sensitivity (~1.15 kHz/ppm) could be achieved. A simple and additive electronic method of tuning is utilized to improve sensitivity as compared with other methods that involve major changes in the sensor.

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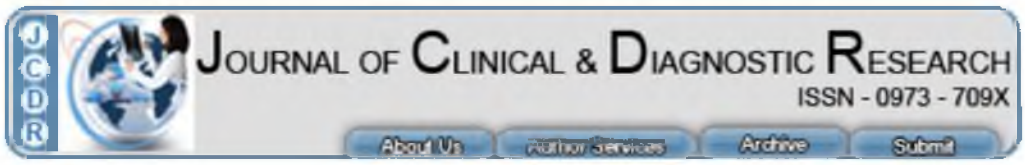

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Alterations in the Reactive Oxygen Species in Peripheral Blood of Chronic Myeloid Leukaemia Patients from Northern India

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Abstract

Go to: ▸

Introduction

There is a significant difference in the Reactive Oxygen Species (ROS) levels of Chronic Myeloid Leukaemia (CML) patients before and during treatment with Tyrosine Kinase Inhibitors (TKIs). This is because high ROS levels support oncogenic phenotype of CML by inducing proliferation pathway and accumulation of further genetic mutations. Often the measurement is done on WBC or serum for ascertaining one type of ROS species, but measurement of global ROS in fresh whole blood will give more accurate estimation of ROS.

Article Details

An Analysis upon Various Strategies for Redesign and Direct Evolution of Enzyme Engineering | *Original Article*

— Sudha Vipin Sharma*, Sunita Hooda, in *Journal of Advances in Science and Technology* | *Science & Technology*

ABSTRACT

Enzymes are biocatalysts evolved in nature to achieve the speed and coordination of nearly all the chemical reactions that define cellular metabolism necessary to develop and maintain life. The application of biocatalysis is growing rapidly, since enzymes offer potential for many exciting applications in industry. The advent of whole genome sequencing projects enabled new approaches for biocatalyst development, based on specialised methods for enzyme heterologous expression and engineering. The engineering of enzymes with altered activity, specificity and stability, using sitedirected mutagenesis and directed evolution techniques are now well established.

The use of enzymes in industrial applications has been recognised for providing clean processes with minimal impact on the environment. Enzyme engineering is undergoing the most profound and exciting transformation in its history. It promises unprecedented expansion in the scope and applicat[illegible]f modified or improved enzymes with desired physi[illegible]l catalytic properties. Two complementary strategies are cu[illegible]ly available: rational redesign and directed evolution. Although

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Comparative study of Removal of Cu and Pb from Aqueous Solution by using Rice Husk Ash as an Adsorbent

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Abstract:- The adsorption efficiency of Rice husk ash powder for the removal of Cu and Pb was studied as Rice husk ash consist of silica , alumina , mangnesium oxide , calcium oxide etc. The research is a batch scale experiment using different amount of adsorbent in solution with five different concentrations (5, 10, 15, 45,100 mg/L) of both metals and in mixed combination. About 92% to 100% Cu removal achieved by using 0.5 to 1.5 g adsorbent for solution having concentration of 5 and 10 mg/L of Cu. Two main things comes out by the above study, first, the adsorption efficiency depends on the amount of adsorbent as the adsorption efficiency of Pb was increased from 80% to 100% in the same solution (5mg/L). it was also found that adsorption efficiency decreased about 2.5 % and 5.8% of Cu and Pb to mixed metal solution, which clearly indicates that the presence of more metals in the solution will decrease the adsorption efficiency.

I. INTRODUCTION

The release of industrial effluents containing heavy metals to the river water causes several adverse effects. Water is essential to all forms of life and makes up 50-96 % of the weight of all plants and animals. It is also a vital resource for agriculture, manufacturing and other human activities. In urban areas, the careless disposal of industrial effluents and other wastes in rivers & lakes may contribute greatly to the poor quality of river water [1-4]. African countries and Asian countries experiencing rapid industrial growth and this are making environmental conservation a difficult task[5] . Heavy metals are dangerous environmental pollutants due to their toxicity and strong tendency to concentrate in environment and in food chains[6-7] . The source of environmental pollution with heavy metals is mainly industry, i.e. metallurgical, electroplating, metal finishing industries, tanneries, chemical manufacturing, mine drainage and battery manufacturing [8]. Considerable research been carried out over the last decade on the protection against plant and animal life degradation. Several big cities contribute to increase this problem, as they are sources of industrial effluents. In order to reduce the environmental pollution, a number of studies been considered to minimize the problems caused by the commonly employed treatment of metal bearing effluents [9-10]. Removal of metals from wastewater achieved principally by the application of several processes such as adsorption[6], sedimentation[11], electrochemical processes[12], ion exchange[13] ,cementation[14], coagulation/flocculation[15] , filtration and membrane processes[16] Chemical precipitation and solvent extraction[17-18] . Adsorption is the one of the important procedure for the removal of heavy metals from the environment because of strong affinity and high loading capacity. Moradabad also known as Brass City of India situated at a distance of 167 km from the national capital, New Delhi (NH 24), on the bank of river Ramganga and located at 28.830 N 780 E. It has an average elevation of 186 meters (610 feet) above sea level. The city has seen rapid industrialization during last few decades. The city is full of brass and steel industries. Most of these industries are in unorganized sector and thus have unplanned growth leaving to high degree of air, water and soil pollution[19-20] . The most of the industries are dumping their effluents in Ram Ganga River pass from the heart of the city. A large number of small-scale manufacturing units of brass been also situated in the heart of the city. As Copper, Zinc & Lead and its compounds used in brass industries, the continued intake of copper and lead by humans leads to severe diseases like mucosal irritation, depression and most dangerous lung cancer. Therefore, there is a considerable need to treat industrial effluents containing such heavy metals prior to discharge to protect public health. The metal needs to be removed from industrial effluents before discharge into the environment to minimize any impact on plant, animal and human beings. In the present study, adsorption potential of low cost adsorbent (Rice husk ash) towards Cu and Pb has been examined.

II. MATERIAL AND METHODS:

Adsorbents The RHA from Amrit Vanaspati Company Ltd Punjab, India. It was washed with distilled water until the pH was constant, dried in an oven at 105°C for 24 h. It was cooled in incubator and determined its size distribution by USA Standard Sieve (≤125, 125-250, 250-500 μm). The size distribution results are shown in Table 1. Thus, studied particle size was 250-500 μm. Preparation of Modified Rice Husk Ash

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Developing a Low Cost Activated Carbon from Agricultural Waste for the Removal of Heavy Metal from Contaminated Water

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Abstract

Rice husk ash is find out from the burning of agricultural waste material in paper industry due to it abundantly available in rice-producing countries. Activated carbon of rice husk (ACRH) was used to remove Cr(VI) from waste water. In this study we also use of the Batch process for study of the effect activated carbon of rice husk for Cr(VI) removal from aqueous solutions. In this paper we also studies of pH effect, contact time, adsorbent dose were examined. The removal decreased from 86.2 to 44.2% by increasing the Cr(VI) concentration from 1.5 to 5.0 mg/l. Removal, however, decreased from 80.0 to 42.2% by increasing the adsorbent particle size from 50 µm to 150 µm. The adsorbed dose of Cr(VI) tend to increase with the increase of pH. It has been found that low cost and high capabilities of the ACRH make it potentially attractive adsorbent for the removal of Cr (VI) from wastewater.

Keywords: Removal; Rice Husk ; Adsorption ; pH; water; Activated Carbon of rice husk etc.

INTRODUCTION

Chromium is an important heavy metal, and it is generally used in leather industry, electroplating, metal processing and paint and pigment. Removal of heavy metals by adsorption is an turn up field of research [5], Activated carbon is an effective adsorbent

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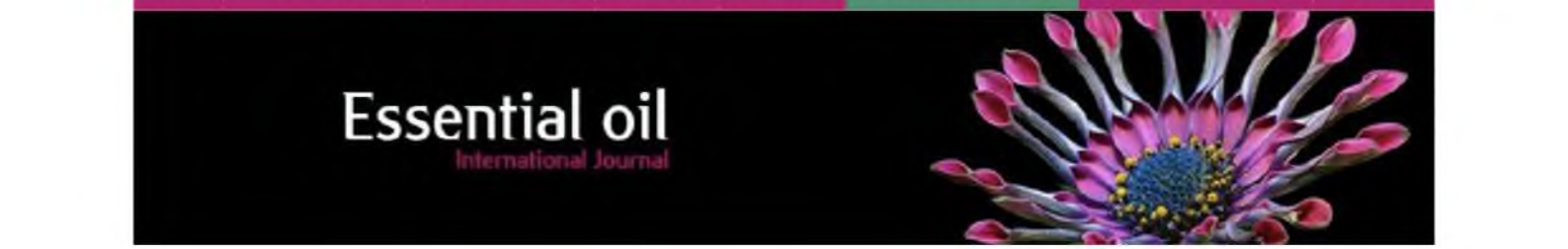

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Sportsmen's energy package *Cordyceps sinensis*: Medicinal importance and responsible phytochemical constituents

AUTHOR(S): Yogesh Chandra Joshi, Mukesh Chandra Joshi, Vivek Chopra, Rakesh Kumar Joshi, Rajni Kant Sharma and Vikrant Kumar

ABSTRACT:
Yarsagumba (*Cordyceps sinensis*) is one of the world rarest fungal species that parasites on the body of a caterpillar of a moth and found underground of alpine grass at high altitude. The *Cordyceps sinensis* is known as "summer plant and winter insect" or "*half*-caterpillar-*half*-mushroom". This fungus used for various medicinal purposes, caring diseases and specially used as a food product in China and south Asian countries. It contains various biologically active pharmacophores which helps to maintain the health and body. Reports say that, the regular use of *Cordyceps*, is very useful for sportsperson to maintain their body balance, endurance, strength, and to make healthy body weight etc. On the basis of scientific and manmade facts, we tried to summarise, why *Cordyceps* is recommended to sport person as a physical booster. It contains various bioactive pharmacophores including essential oil, which are medicinally important. Thus body always looks for such type of dietary supplements.

Pages: 37-51 | **2058** Views **71** Downloads

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Online Signature Verification: A Review

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Abstract: *In past few decades Online Signature Verification have been employed in many applications such as security control, banking, law enforcement etc. A number of techniques have been proposed in the realization of reliable signature verification system such as Dynamic Time Wrapping (DTW), Hidden Markov Model (HMM), Support Vector Machine (SVM) and Neural Networks (NN)In this paper we have presented a review of research carried out in recent field of online signature verification and made a qualitative analysis of these state-of-the-art approaches.*

Keywords: *Signatures, Verification, fraudulence, feature Extraction, training, Forgery*

I. Introduction

Biometrics is the utilization of physiological traits (face, iris, and fingerprint) or behavioral traits (signature, voice) for the verification of an individual identity. Biometric based authentication system is a trustable alternative to the password-based security systems as it is relatively hard to be forgotten, stolen, or guessed.

Signature being a behavioural biometric it is mainly used in the banks to verify the checks and accounts. Unlike physiological biometrics, it is fraught with problem of change over a time and it is not difficult to forge. One of the main challenges in signature verification is related to the signature variability. While signatures from the same user show considerable differences between different captures (high intra-class variability), skilled forgers can perform signatures with high resemblance to the user's signature (low intra- class variability). Signature verification aims at using such properties for making reliable authentication. However the wide spread acceptance of the signature by the public makes it more suitable for certain lower-security authentication needs. However, signature verification is a challenging task due to practical constraints. For instance, MasterCard estimates a $450 million loss each year due to credit card fraud, likewise some billions of dollars being lost because of fraudulent encashment of checks. Reliable automatic signature verification could be a proper solution to reduce such losses since handwritten signatures are already involved in the credit card transactions and bank checks encashment.

1.1 The Signature Verification Modes

There are two modes to the signature verification depending on how the signatures are collected from a user.

Offline (static) Signature Verification: In this mode data is acquired by scanning handwritten signatures which are then processed as static images. The verification is based on these static signature images. This mode is useful in automatic verification of signatures obtained from bank checks and other paper documents.

Online (dynamic) Signature Verification: In this mode the signatures are captured by social hardware (e.g. smart pens or pressure sensitive tablets) which is capable of measuring dynamic properties of a signature in addition to the shape, while shape is the only information in offline signatures. Dynamic information (e.g. pen pressure) makes the signature more unique and more difficult to forge.

Applications of online signature verification include identity verification in payments using a credit card; authorization of computer users for accessing sensitive data or programs, authentication of individuals for accessing physical devices or buildings, and protection of small personal devices from unauthorized usage.

Online signature verification is more robust, reliable and accurate than offline signature verification as its dynamic properties make the process of forging an online signature more difficult. Therefore online signature has become an attractive biometric method as it facilitates the authentication of the internet transactions and contracts (e-commerce, e-banking, e-business, e-contract).

Need

Signature is a special characteristic of any person. By the help of signature we can identify the person. In today day to day life as we talk about the verification of any person, we normally verify them by two ways firstly by face and secondly by signature. In banking or security system the person is normally verified by his or her signature. Hence we can say that the signature is alternate way to identify the person. In most of the organizations, the signature is normally verified by their experts by matching old signature's samples.

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Comparative Analysis on Path Planning Algorithm's on Mobile Robot in Image Processing

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Abstract:- *This paper presents an analysis on different path planning algorithms for mobile robot in static environment. It investigates three well known path panning algorithms and compared their performance on the basis of their working parameters and the computation time to find the solution. It also finds the shortest distance for the static environment and compared the computational distance from start to goal point at different levels for all the three algorithms. It has been tested at different shape of the image and computational time and length for all the three algorithms and verified. Image processing places an important role in the field of mobile robot navigation. There are different methods are used for navigation. In this paper, we reviewed around 23 papers are briefly described the amount of existence of the work for each motion planning approach. This paper includes a comparative study using C++ based approach on mobile robot with respect to image processing. Showing how the behavior and activity of the research paper has taken a change towards the navigation processes which controls navigation using NFT , A*and D*Lite algorithms. It has been seen that many times the researchers use image processing technique for obstacle avoidance or it use singles from gesture control or it takes the help of smart phone with sensor to find the obstacle to reach the destination. Finally some open areas and challenging topics are discussed. There are many different algorithms developed for the path planning by researchers in the field of robotics, water based resources, navigation and internet based games. The algorithms used in this field is A*, D* Lite and NFT (neighbour finding technique). Here we compared three algorithms and established a comparison path based approach to differentiate both the algorithms. We used a grid search technique using A* algorithm and quad tree approach using neighbour finding technique algorithm and also we used a DDA algorithm to optimize the NFT based path planning approach and compared.*

Keywords: *Path Planning, Algorithms, Grid search, Quad Tree, NFT (Neighbour finding technique), D*Lite, Digital Differential Analyzer (DDA).*

I. INTRODUCTION

The field shortest path planning is closely related to robotics where as the algorithms used here applied in different fields as per the requirement. Planning mobile robot is a challenging task for mobile robot navigation and also researchers provided different approaches for the shortest path planning strategies in the field of mobile robot games and many more applications. Each plan has its own advantage and disadvantage the basic goal is to reach the robot from source to destination. Here we used grid search and quad tree based path planning method for path planning with the help of A* algorithm[3,16] , Neighbour finding method[6,7] and D* Lite[8] to verify the difference in their approach .Here we have presented a real image presented in the form of square picture shape and represented at different part of the block as shown in the fig1 (a, b, c).The boundary is taken as (80,80) and (400,500)).In this paper we planned for robots for different algorithms. First we represent the image as a square of different size then embedded these different size images in the (80,80) and (400,500) screen size. After the design is proposed all used algorithms introduced and applied on the image to find the shortest path. These all are it are simulated and the result is compared.

II. THE APPROCH

The quadtree initially come up with [4] , It is an approach where the complete tree is represented as a square and the square is divided in to four sub branches of equal size ad shown in fig 1(a) as row1 and coum1(R1C1) and row1colum2(R1C2) and also the tree form in a said form that each node has four different quadrants as shown in fig 1(b,c) While dividing the [6] image into four quadrants each node has four sons each node represented with(R1C1,R1C2,R2C1,R2C2).

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IMPACT OF DDA OPTIMIZATION ON MOBILE ROBOT PATH PLANNING FOR MIXED IMAGE IN IMAGE PROCESSING

Rama Kanta Choudhury, Chandra Kanta Samal

ABSTRACT

Existing problem solving in the day to day environment requires computational intelligence. Path planning is one of the most important technologies in the navigation of the mobile robot, which should meet the optimization and real-time requests. The objective of the paper is to present a noble approach to find the efficient and effective path planning for mobile robot. Here first the image is located on the graph and then a quadtree is formed, according to the working space image with respect to the obstacle image. Then the NFT algorithm is used to obtain the shortest path from the start point to the goal point in the graph. Finally the DDA optimization algorithm is adopted to get the optimal path. Aiming at the shortcoming of the DDA algorithm which is easily plunging into the local minimum, DDA algorithm with NFT is put forward. The results of the simulation demonstrate the effectiveness of the proposed method, which can meet the real-time requests of the mobile robot's navigation. Here we have taken two different types of images, one square shape and other is mixed image of different shapes like triangle and circle. The working space is tested and result is verified using NFT Algorithm with DDA optimization.

KEYWORDS

DDA, Grid search, Quadtreee, NFT (Neighbour finding technique)

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Target Assignment in Robotics and its Distance Optimality Using DDA Optimization in Image Processing

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ABSTRACT

Many difficult problems solving require computational intelligence. One of the major directions in artificial intelligence consists in the development of efficient computational intelligence algorithms, evolutionary algorithms, and neural networks. Some systems operate in isolation or cooperate with each other, some optimized techniques are used to resolve the mobile path planning, DDA is one of them. The behavior could emerge an intelligence called systems intelligence, and intelligence of a system. The shortest path planning approach and its optimization for the mobile robot in a static and dynamic environment are the major tasks in the field of Robotics. In the present day environment finding collision-free, the shortest path is the fundamental issue in the path planning. In the mobile robot, the processing time and reaching time is very important. The path time is to be reduced so that the complexity is reduced. During the process, it is found that few algorithms have its own advantages and disadvantages. Here we presented a DDA optimization technique for optimization.

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Mobile Robot Path Planning Approach: A Review

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Abstract

The shortest path planning approach and it's optimization for mobile robot in static and dynamic environment is the major task in the field of Robotics. In the present day environment finding collision free shortest path is the fundamental issue in the path planning. We have reviewed 100 papers on path finding technique in static and dynamic environment. Path planning in static environment is easy as compared to dynamic environment as in dynamic environment the obstacles are moving. Whereas optimizing the path is difficult in the static environment as well as in the dynamic environment. As per the timing is concerned, the path time is to be reduced so that the complexity is reduced. During the review process it is found that few algorithms have its own advantages and disadvantages as presented. Also a comparative study of different path planning techniques for static and dynamic environment is provided in this paper. The main focus in this review is to find the shortest path efficiently and effectively.

Keywords: *Path Planning, Algorithms, Grid search, Quad Tree, NFT (Neighbour finding technique), D*Lite*

1. Introduction

The survey is distributed into different sections as per our requirement. the main aim of this survey is to find the shortest path from source to destination with known and unknown environment in the presence of obstacles or when the obstacles come on the way. Mobile robots are authorized to move automatically from one point to other to reach their destination. They choose their own path to reach their destination without any hindrance with their preplanned path [1]. This paper provides a review of such papers based on their way to reach the target with the specified algorithms. Here we have reviewed many approaches and implemented. Efficient path planning approach is very important for mobile robot to follow the path. Here the main approach of the review is to find the different algorithms used and approached to find the shortest path from source to destination. Here the configuration of the robot is described by number of obstacles based on their position and sense of direction of the robot in the 2D and 3D environment [2]. A clear idea of planning and computing of collision free path is presented with given points with different algorithms. While reviewing papers we found that in mobile robot navigation, researchers used many algorithms out of which are A*, D* and D*Lite algorithm with grid search and quad tree methods [2][3][4][10][12][13]. ***The task of moving robots in mapped environments is a step by step approach; planning of the paths, optimal by certain criteria and controlling the robot to execute the planned paths. In this path planning, the task of finding a collision free path is to lead a robot from the initial configuration to the goal configuration among a set of obstacles. Generally, obstacles are modeled as polygons. The initial and the goal configurations are described by the***

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Architecture Based on Environmental Monitoring System using ZigBee Wireless Sensor Networks

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Abstract

Wireless Ad hoc sensor nodes are playing an important role in wireless data transmission infrastructure in various environmental monitoring systems. Due to its compact size and energy efficient structure these nodes can be successfully deployed in wireless Ad hoc infrastructure. Recent developments wireless sensor technologies have provided the environmental management systems with capabilities of real time remote environmental monitoring system. We propose system architecture for wireless sensor networks and a database model for handling and storing sensor data stream in real time. The ZigBee wireless sensor networks is useful especially in monitoring or detecting possible natural disasters and reporting on it almost at real-time. A web based application developed to enable remote online access to wireless sensor network data with interactive data retrieval and visualization functionalities. The advantage of modular architecture is minimizing the software upgrade down time and enables hardware reusability.

Keywords:- ZigBee Network, Wireless Sensor Network, Disaster, Modular Architecture, Database Model.

1. Introduction

A Wireless sensor network (WSN) is a self configured and infrastructure less wireless networks. It consists of a number of sensors nodes (few tens to thousands) working together to monitor a region to obtain data about the environment. There are two types of WSNs: structured and unstructured. Unstructured WSN contains dense collection of sensor nodes and often deployed in ad-hoc manner in the field. In an ad-hoc deployment, sensor nodes can be dropped from a plane and randomly into the target area. In structured WSN on the other hand, all or some of the sensor nodes are deployed in a pre-determined locations. Structured network has fewer nodes and can be deployed with lower network maintenance and management costs.

A wireless sensor network (WSN) to monitor physical or environmental conditions such as temperature, sound, pressure, vibration, pollutants and to cooperatively pass their data through the network to a main location, where the data can be observed and analyzed . Wireless sensor networks have application of fields such as climate control, environmental monitoring, military surveillance, structural health monitoring, medical diagnostics, disaster management and emergency response [4]. The sensor nodes can communicate among themselves using radio signals and they have limited processing speed, storage capacity and communication bandwidth. The ZigBee Wireless Networks based on the IEEE Standard 802.15.4 as specifications, this wireless sensor networks (WSN) consists of light-weight, low power and small size sensor nodes (SNs). They have ability to monitor, calculate and communicate wirelessly. A set of applications require simple wireless connectivity, relaxed throughput, very low power, short distance and inexpensive hardware e.g. Industrial, Agricultural, Vehicular, Residential, Medical etc. Global climate change and atmospheric warming is increasing the occurrence of extreme climate phenomenon with increasing severity, both in context of human living as well as economic losses.

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Low Power Consumption in ZigBee Wireless Networks: A Survey

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Abstract

The ZigBee technology is an IEEE 802.15.4 standard for data communications dealing with business and consumer devices. The ZigBee standard provides network, security and application support services operating on top of the IEEE 802.15.4 Medium Access Control (MAC) and Physical Layer wireless standard. ZigBee is a low-cost, low-power, wireless mesh networking standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking which promises high reliability and larger range. In industry ZigBee is being used for next generation automated manufacturing, with small transmitters in every device on the floor, allowing for communication between devices to a central computer. This new level communication technology permits finely-tuned remote monitoring and manipulation.

Keywords:- *ZigBee, MAC, Wireless mesh networking, High reliability, Communication technology etc.*

I INTRODUCTION

The ZigBee technology is the wireless mesh networking standard created for connecting sensors, instrumentation and control systems. This is based on the IEEE 802.15.4 Standard and used in Wireless Personal Area Networks (WPANs) for high level communication. This technology is created by the ZigBee Alliance. Wireless sensor networks (WSN) consists of light-weight, low power and small size sensor nodes (SNs) [3]. They have ability to monitor, calculate and communicate wirelessly. The ZigBee Alliance organized as an independent, neutral and non profit corporation in 2002, it is open and global and any one can join and participate, membership is global. An organization with a mission to define reliable, cost effective, low-power, wirelessly networked, monitoring and control products based on an open global standard. Alliance provides interoperability, certification testing, and branding [15].

IEEE 802.15.4 is a standard which specifies the physical layer and media access control for low-rate wireless personal area networks (LR-WPANs). It is maintained by the IEEE 802.15 working group, which defined it in 2003 [3]. IEEE standard 802.15.4 as specifications for low-data-rate wireless connectivity with fixed, portable, and moving devices with no battery or very limited battery consumption requirements typically operating in the personal operating space (POS) of 10m [15]. It is foreseen that, depending on the application, a longer range at a lower data rate. The ZigBee wireless networks targets the application domain of low power, low duty cycle and low data rate requirement devices. Figure-1 below shows the example of a ZigBee networks. The ZigBee Networks, Coordinators are the most capable of the three node types. There is exactly one coordinator in each network and it is the device that establishes the network originally. It is able to store information about the network with including security keys. Routers act as intermediate nodes, relaying data from other devices.

Table-1: ZigBee 802.15.4 standard specifications

Parameter	Range
Transmission Range(meters)	1-100
Battery Life (days)	100-1,000
Network Size(# of nodes)	>64,000
Throughput(kb/s)	20-250

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THE WHITE WOMAN'S GAZE

The nineteenth century was, perhaps, the greatest period of travel writing. Under Queen Victoria, Britain became the greatest power in the world with political and economic control over her colonies spread all over the globe, from Asia to Africa and the Caribbean Islands. Many British travellers and missionaries went to the colonies to take up what Kipling called the "White Man's Burden" – to "civilize" the "barbaric" races of Asia and Africa. Kipling urged them to take on the responsibility of ruling the Empire in his poems:

Take up the White Man's Burden –
Send forth the best ye breed –
Go, bind your son's in exile
To serve your captive's need:
To wait in heavy harness
On fluttered folk and wild –
Your new-caught, sullen peoples,
Half-devil and half-child.

- The White Man's Burden, 1899

These were Englishmen who saw the East "as an inferior, degenerate, erotic place which requires the guiding light of Western civilization" (Laishram 27). The East offered them a chance to escape boredom, failure and poverty in England. India and the East also offered an opportunity to secure wealth and adventure, prestige and identity. Ram Chandra Prasad, in his work on early English travellers to India, differentiates between the attitudes of the early travellers and the ones who came later: "The European travellers of the fifteenth and sixteenth centuries continued to approach India in a mood of child-like wonder, without the least sense of racial superiority. Until

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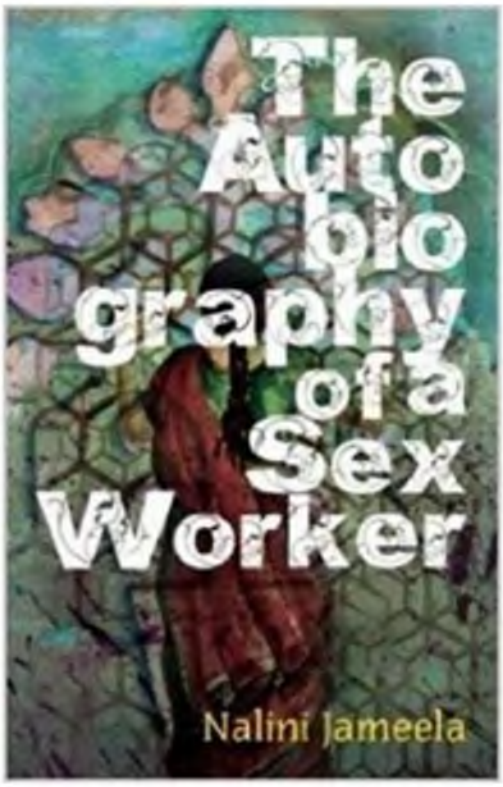
Society and Sex Work in *The Autobiography of a Sex Worker* by Nalini Jameela

Manoj Kumar Garg, M.A., M.Phil.



Abstract

Sex workers are part of society but they are looked down upon as outcast in Indian society. They are exploited, insulted and humiliated. Even female sex workers are not taken as women rather taken as mere sex objects. Nalini Jameela portrays their plight through her biography *The Autobiography of a Sex Worker*. She herself has worked as a sex worker. She doesn't condemn the sex work rather takes it as a profession. This paper studies the problems faced by the sex workers, dual standards of society, and resilience of the sex workers.

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Adoption of Free and Open Source Software in India

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Abstract

The significance and robustness of Free and Open Source Software (FOSS) are now well known at stages of development as well as deployment. It's natural to assume that the products of FOSS to be deployed as a preference over the commercially available propriety software. However, proprietary software not only exists but is also thriving. The present paper looks into the aspect of adoption of FOSS, with special emphasis to India. The two natural arena for adoption- Governance and Academia are chosen for study. The policy initiatives, frameworks and challenges in the implementation of FOSS in these two areas are discussed, while giving instances of its successful adoption. The study also discusses in brief the adoption of FOSS in business enterprise, where its adoption is dynamic and accelerated. Several challenges in adoption of FOSS over propriety software are also pointed out.

Keywords: Adoption, FOSS, Proprietary software

INTRODUCTION

The Free and Open Source Software (FOSS) movement attained prominence in the 1980s, primarily to unshackle the restrictions imposed on the use of copy righted software, now known as CSS (Closed Source Software). Today, although one may not be aware, FOSS is actually providing for the computational requirements for a large spectrum of products and services which make the modern, technologically intensive digital life possible. Most of the smart phones (android based), servers and portals, ATMs, supercomputers, databases etc around the world are FOSS driven. In India, two humongous citizen-specific projects – Aadhar's online infrastructure and the railway booking website utilizes the Linux servers. The FOSS provides a myriad of advantages over the CSS at all stages – development, distribution and research, which have been extensively mentioned in the literature [1-5]. Given the intrinsic freedom of usage, customization, propagation and the relative cost effectiveness which all products of FOSS offers, the adoption of FOSS by a country like India could have been a natural and prudent choice as the nation endevours to upscale the use of IT (information technologies) in its pursuit of digital governance. In this context, one may be betting on India becoming the global FOSS hub. It's evident to expect that the India is a fertile ground for the nurturing of a strong and mature FOSS ecosystem. A FOSS ecosystem comprises of a multitude of stakeholders – government, academic institutions like schools and colleges, FOSS solution providers and the FOSS community. Moreover, in India there is no dearth of business opportunities for providing IT solutions to enterprise. This is because India is only next to China in having the largest base of Internet users, notwithstanding the fact that 80 per cent of its population still needs to go online. When this is seen in the background of the availability in the last two decades of large number of reliable and robust FOSS products, which provides solutions for all domains, wherein the CSS have hitherto provided the services (Refer Table 1) the above expectation is certainly not misplaced.

So, where does India stand on the adoption of free software? The adoption of FOSS in India, until now can be described as patchy and sporadic, without a concerted push to adopt FOSS in the daily computational needs of various spheres viz., Governance, academia and business enterprise. However, it must be mentioned here that although the growth of FOSS in India has witnessed a faster rate than the past, the FOSS ecosystem is far from the threshold level of maturity. This has resulted into a narrow user base for FOSS in India. The government's efforts for FOSS adoption have been varied. While some efforts are subtle, voluntary and staggered, some migrations to FOSS have been hard and coercive. In most cases, migration to FOSS are justified from the perspectives of cost and security and its salient features of being participative, egalitarian and democratic is not emphasized sufficiently. While the goal of making India a global hub for FOSS is laudable, it becomes necessary to examine the extent of adoption and the associated challenges in the migration to FOSS for the computational needs of the digital society which we envisage in India. The present paper surveys the extent of adoption of FOSS in the three major areas of the Indian society i.e., Governance, academia and business enterprise. The study also attempts to identify the impediments in each of these spheres which are inhibiting the development of a supportive and mature ecosystem around FOSS which can harness FOSS to its full potential.

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ARTICLE NAVIGATION

RESEARCH ARTICLE | AUGUST 07 2017

Nanosecond laser-cluster interactions at $10^9 - 10^{12}$ $\mathrm{W/cm^2}$

Rohtash Singh; V. K. Tripathi; R. K. Vatsa; D. Das

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An analytical model and a numerical code are developed to study the evolution of multiple charge states of ions by irradiating clusters of atoms of a high atomic number (e.g., Xe) by $1.06\ \mu\mathrm{m}$ and $0.53\ \mu\mathrm{m}$ nanosecond laser pulses of an intensity in the range of $10^9 - 10^{12}\ \mathrm{W/cm^2}$. The laser turns clusters into plasma nanoballs. Initially, the momentum randomizing collisions of electrons are with neutrals, but soon these are taken over by collisions with ions. The ionization of an ion to the next higher state of ionization is taken to be caused by an energetic free electron impact, and the rates of impact ionization are suitably modelled by having an inverse exponential dependence of ionizing collision frequency on the ratio of ionization potential to electron temperature. Cluster expansion led adiabatic cooling is a major limiting mechanism on electron temperature. In the intensity range considered, ionization states up to 7 are expected with nanosecond pulses. Another possible mechanism, filamentation of the laser, has also been considered to account for the observation of higher charged states. However, filamentation is seen to be insufficient to cause substantial local enhancement in the intensity to affect electron heating rates.

Topics

Adiabatic process, Lasers, Ions and properties, Chemical

Laser and Particle Beams

Pulse-compression and self-focusing of Gaussian laser pulses in plasma having relativistic–ponderomotive nonlinearity

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S. Kumar, P.K. Gupta, R.K. Singh, S. Sharma, R. Uma and R.P. Sharma

Article contents

Abstract

The mathematical model for the propagation of intense laser pulse in a plasma having Gaussian profile is investigated. The model has been formulated considering that the relativistic–ponderomotive nonlinearity dominates over other nonlinearities in the plasma. Model equation for self-compression and self-focusing properties of the laser pulse has been set up and solved by both semi-analytical and numerical methods. The result indicates that due to the effect of group velocity dispersion, diffraction of the laser pulse and the nonlinearity of medium, the pulse width parameter as well as beam width parameter of pulse gets focused at a different normalized distance, and hence the normalized intensity is also deferred at those points. Numerical simulation shows an oscillatory behavior of intensity during propagation in the plasma either having minimum beam radius (r_0) or having minimum pulse duration (t_0) depending on the normalized distance.

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Detection of liquefied petroleum gas below lowest explosion limit (LEL) using nanostructured hexagonal strontium ferrite thin film

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ABSTRACT

The nano crystalline hexagonal strontium ferrite nanoparticles $SrFe_{12}O_{19}$ were synthesized successfully by chemical co-precipitation method. Thin films of strontium ferrite were prepared on glass substrate and characterized by various techniques such as XRD, SEM, TEM, EDS, UV-spectroscopy and FTIR. XRD pattern revealed the phase transformation of M-type hexa-ferrite with the minimum crystallite size of 18 nm. Uniform macroporous surface structure of the film was exposed by SEM images. Existence of iron, strontium and oxygen in the material was confirmed by EDX. Optical characterization of the material was done by UV-Spectroscopy and band gap was found as 3.2 eV. The liquefied petroleum gas (LPG) sensing behavior of strontium ferrite film was investigated at room temperature. The variations in electrical resistance of the film were measured with the exposure of LPG with respect to time as a function of concentration (0.5–5 vol.%) of LPG. The maximum value of sensitivity for these films was found 7 and maximum sensor response was 602.23.

1. Introduction

Surface to volume ratio and quantum confinement elucidate to nanostructure of materials. Ferrites are basically a class of materials which contains iron oxides having fascinating magnetic and electric properties [1]. These are prepared by sintering various transition metal oxides along with the alkaline earth metal oxide. Development of new class of ferrites, and studies on improvements in their properties began in early 90's. On the basis of technological application, magnets are distinguished as soft magnetic materials and hard magnetic materials [2]. Soft magnetic materials are those magnetic materials whose domains shift when magnetic field is applied and hard magnetic materials are those with less mobility of domain wall. Magnetized hard ferrites possess hexagonal structure with high value of magnetization and magnetocrystalline anisotropy so these are termed as M phase ferrites, with M as Ba, Sr or Pb [3,4]. $SrO\text{-}Fe_2O_3$ binary system has few ternary oxides including $SrFe_{12}O_{19}$, $SrFe_2O_4$, $Sr_2Fe_2O_5$ and $Sr_3Fe_2O_6$. Among these, $SrFe_{12}O_{19}$ has attracted the attention of most of the researchers due to its vast area of applications beside a stable characteristic-sand having high electrical resistivity. Strontium ferrite contains strontium and iron where strontium is S block element belonging to group 2 period 5 with $5s^2$ electronic configuration and iron belonging to d-block element group 8 period 4 with electronic configuration $3d^64s^2$ [5]. Crystal structure of M-phase ferrite is complex but can be described as hexagonal with unique axis. $SrFe_{12}O_{19}$ posses 64 ions per unit cell along with 11 different symmerty sites. Oxygen atoms are closely packed at interstitial position with Sr and Fe in ten layers along with the C-axis. The iron atoms are positioned at five different crystallographic sites 2a, 2b, 4f, 4k and 12k. Among them 12k, 4k, 2a are on octahedral site, 4f on tetrahedral site and 2b forming trigonal bipyramid surrounding by five oxygen atoms. Strontium ferrite is used for LPG sensing because of relatively high resistance and special magnetic resonance properties for adsorption. In strontium ferrite, there are large interstitial sites which interact with the oxygen molecules in comparison to other ferrites. The dielectric properties of strontium ferrite shed light on the charge carriers which are responsible for charge transport phenomenon. These ferrites can be prepared by different methods viz. as chemical co-precipitation, sol-gel, ball milling, solid state reaction and reverse micelle process [6–10].

Kanagesan et al. prepared the strontium ferrite nano powder by sol-gel method and carried out investigation on the crystalline $SrFe_{12}O_{19}$ powder using XRD. The average particle size was found to be 80–100 nm and its thermal analysis revealed its endothermic and exothermic reaction peaks [11]. T.T.V. Nga et al. investigated

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Growth and characterization of sol–gel processed rectangular shaped nanostructured ferric oxide thin film followed by humidity and gas sensing

B. C. Yadav, K. S. Chauhan, S. Singh, R. K. Sonker, S. Sikarwar & R. Kumar

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Abstract

In the present work nanostructured ferric oxide has been synthesized using sol–gel method. Thin films of ferric oxide were fabricated via spin coating process. The surface of the thin film was scanned by scanning electron microscope that exhibited the surface morphology of ferric oxide nanostructures. The material was also characterized by XRD, Acoustic particle sizer and FTIR. All the particles distributed on the surface have some spaces among them known as pores. These pores serve as adsorption sites for moisture and other gases. EDX confirmed the elements forming the ferric oxide in pure form. The particle size of the ferric oxide was estimated as ~12.2 nm. The pore size of the film was ~50 nm i.e., nature is mesoporous. Annealing effect on the surface morphology was also observed. Humidity sensing, electrical as well as optical of the prepared film was carried out. The results showed the suitability of material for the development of humidity sensors. Variations in resistance with the exposure of LPG were recorded and found that resistance of film increases with the increasing exposure time and concentration of gas. The maximum sensing response of the sensor was recorded as 3.26 for 1000 ppm at room temperature. The response and recovery times of the sensor were found to be ~12 and 9 min, respectively.

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Development of Fe_2O_3–PANI nanocomposite thin film based sensor for NO_2 detection

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ABSTRACT

The iron oxide-polyaniline (α-Fe_2O_3–PANI) films were prepared by spin coating method on various corning glass substrates over Pt inter-digital electrodes (IDEs). The prepared film was characterised using XRD, SEM, AFM, UV-vis and FTIR. Also, it was employed for NO_2 sensing. The nanostructured α-Fe_2O_3–PANI film showed a high sensing response ~2.29×10^2 towards 20 ppm of NO_2 gas. Besides giving the higher sensing response towards NO_2 gas, α-Fe_2O_3–PANI sensor structure was found to be highly selective and exhibited the poor gas sensing response towards other interfering gases including e.g. Acetone, IPA, NH_3, LPG and CO_2. The investigated sensor can be used for the detection of NO_2 at the industrial level.

1. Introduction

Among the nanosized metal oxides that have been the focus of research due to their potential application in electronic devices, maghemite (<alpha>-Fe_2O_3) has attained prominence due to its magnetic, photocatalytic and electrochemical properties [1–4]. The electrical resistance of semiconductor oxides, such as SnO_2, ZnO, TiO_2 and Fe_2O_3, has a strong dependence on the concentration of surrounding gases. Therefore, oxides are commercially designed as chemical sensors to detect the toxic gases [5–10]. With this intention, several methods of preparation of ferric oxides such as co-precipitation, microemulsion, pulsed wire discharge and hydrothermal processes are employed in order to obtain nanostructured powder [11–13]. The sol-gel process has a unique advantage of producing large-surface-area films at low cost, which is useful to enhance the gas sensitivity [14].

Polyaniline (PANI) as a typical conducting polymer has received a great deal of attention recently [15,16]. With regard to the background, using a composite carrier composed of PANI and ferric oxide nanoparticles could combine the excellent properties of ferric oxide and polyaniline, in addition, a synergistic effect might play a role in enhancing the properties of nanocomposite catalysts. They have unique electronic properties due to the π-conjugation present in their backbones and display improved characteristics over conventional sensors based on nanometal oxides. As NO_2 is a toxic and dangerous gas even at very low concentration (≥20 ppm), therefore, there is an urgent need for a reliable and robust gas sensor for the detection of NO_2 [17].

In the present investigation, PANI/α-Fe_2O_3 nanocomposite thin film has been prepared on the corning glass substrate via chemical polymerization method and tested for the electrical response of the thin film to NO_2 gas at room temperature.

2. Experimental

2.1. Synthesis of nanostructures

In this experiment, 0.1 M of iron nitrate ($Fe(NO_3)_3 \cdot 9H_2O$, Aldrich 98% purity) was used as a precursor solution, 0.1 M of monohydrate citric acid solution as legend molecules and 150 ml distilled water as the solvent. The prepared ferric nitrate solution was added to the citric acid solution dropwise with vigorous stirring. The obtained solution was then heated to a temperature from 70 °C to 120 °C, with vigorous stirring until the gel was formed. Such prepared precursor was used to fabricate the thin films on various corning glass substrates over Pt-IDE using spin coating process [18].

For the formation of the powder, the gel was precipitated by adding NH_4OH dropwise. The powder was then dried at 80 °C for 4 h and the crushed powder was annealed at 500 °C for 2 h Fig. 1(a) shows the flow chart of the growth of PANI [19].

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Preparation of PANI doped TiO_2 nanocomposite thin film and its relevance as room temperature liquefied petroleum gas sensor

Rakesh K. Sonker[1,2] · B. C. Yadav[1] · S. R. Sabhajeet[1]

Received: 11 March 2017 / Accepted: 6 June 2017 / Published online: 10 June 2017

Abstract Present work reports the utility of PANI doped titanium dioxide thin film prepared by spin coating technique as LPG sensing. Optical properties were studied using UV–Vis absorption spectroscopy and FTIR spectroscopy. The surface morphology and structure of synthesized material were characterized by SEM and XRD analysis, respectively. The structural analysis confirmed the formation of TiO_2–PANI having an average crystallite size 21 nm. Variations in the resistance with exposure of LPG to the sensing element were observed. Sensor response (S) as a function of time was calculated and its maximum value was found as 2.37 towards 2000 ppm of LPG, response time of the sensor was 2 min. The sensor was quite sensitive to LPG and results were found reproducible.

1 Introduction

Liquefied petroleum gas (LPG) contains the hydrocarbons, majority propane, and butane. The lower explosive limit (LEL) as specified by National Institute for Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) standards for chemical hazards is average 20,000 ppm by volume 2.0% in air. The permissible exposure limit (PEL) for LPG as specified by NIOSH and OSHA standards is 1000 ppm [1]. The various kinds of materials are used for the detection of reducing LPG gas [2]. Among them, semiconducting metal oxides such as titania (TiO_2) [3], tin dioxide [4], copper ferrite [5] and zinc oxide [6] have been studied extensively. TiO_2 as an n-type semiconducting metal oxide with two distinct phases; anatase and rutile, has been used for a broad range of LPG gas sensing [3, 4]. PANI has been prepared by oxidation of the aniline or anilinium salts e.g. aniline hydrochloride or aniline sulphate, in aqueous acidic ambient [7]. It is a p-type semiconducting material [8] and has specific redox nature, controllable conductivity, and considerable thermal stability [9, 10].

In this work, for the first time, TiO_2–PANI nanocomposite thin film was prepared on a corning glass substrate and employed as LPG sensor.

2 Experimental

Titanium tetrachloride ($TiCl_4$), propanol, deionized water (DI), ethanol, aniline, HCl, ammonium persulphate (APS) and ammonium hydroxide used for the sensor preparation were purchased from Sigma Aldrich Chemical Co. with 99.99% purity. 500 ml distilled water was dissolved with 50 ml HCl followed by 8.33 ml Aniline. After vigorous stirring in ice bath, it was indexed as part (I). 18.924 gm APS was mixed in 331 ml distilled water and after vigorous stirring the solution was indexed as part (II). Now Part I was added with part II followed by vigorous stirring for 2 h. A colour less filtrate was obtained. After drying it at 40–50 °C for 4–5 h, emeraldine salt of PANI was prepared. Later it was washed with NaOH and filtered. Filtrate was

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Development of Fe_2O_3–PANI nanocomposite thin film based sensor for NO_2 detection

Rakesh K. Sonker [a b], B.C. Yadav [a]

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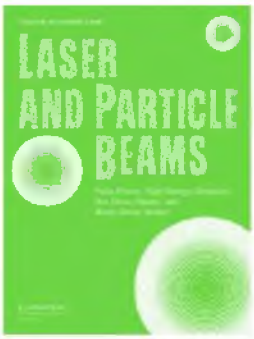
https://doi.org/10.1016/j.jtice.2017.04.042 Get rights and content

Abstract

The iron oxide-polyaniline (α-Fe_2O_3–PANI) films were prepared by spin coating method on various corning glass substrates over Pt inter-digital electrodes (IDEs). The prepared film was characterised using XRD, SEM, AFM, UV-vis and FTIR. Also, it was employed for NO_2 sensing. The nanostructured α-Fe_2O_3–PANI film showed a high sensing response ~2.29×10^2 towards 20 ppm of NO_2 gas. Besides giving the higher sensing response towards NO_2 gas, α-Fe_2O_3–PANI sensor structure was found to be highly selective and exhibited the poor gas sensing response towards other interfering gases including *e.g.* Acetone, IPA, NH_3, LPG and CO_2. The investigated sensor can be used for the detection of NO_2 at the industrial level.



Laser and Particle Beams

Article contents

Self-compression of two co-propagating laser pulse having relativistic nonlinearity in plasma

Published online by Cambridge University Press: **20 November 2017**

S. Kumar, P. K. Gupta, R. K. Singh, R. Uma and R. P. Sharma

Article Metrics

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Abstract

The study proposes a semi-analytical model for the pulse compression of two co-propagating intense laser beams having Gaussian intensity profile in the temporal domain. The high power laser beams create the relativistic nonlinearity during propagation in plasma, which leads to the modification of the refractive index profile. The co-propagating laser beams get self- compressed by virtue of group velocity dispersion and induced nonlinearity. The induced nonlinearity in the plasma broadens the frequency spectrum of the pulse via self-phase modulation, turn to shorter the pulse duration and enhancement of laser beam intensity. The nonlinear Schrodinger equations were set up for co-propagating laser beams in plasmas and have been solved in Matlab by considering paraxial approximation. The propagation characteristics of both laser beams inside plasma are divided into three regions through the critical divider curve, which has been plotted between pulse width τ_{01} and laser beam power P_{01}. Based on the preferred value of critical parameters, these regions are oscillatory compression, oscillatory broadening, and steady broadening. In findings, it is observed that the compression of the laser beam depends on the combined intensity of both beams, plasma density, and initial pulse width.

Keywords

Characteristic beam propagation | Relativistic laser–plasma interaction | Self-compression

Physics Letters A
Volume 381, Issue 29, 5 August 2017, Pages 2337-2343

Partially synchronized states in an ensemble of chemo-mechanical oscillators

Pawan Kumar, Dinesh Kumar Verma, P. Parmananda

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Highlights

- Collective dynamics of coupled chemo-mechanical oscillators are studied experimentally.
- Two different coupling scenarios are entertained.
- For both the coupling scenarios, the collective dynamics exhibit partially synchronized states.

Abstract

Partially synchronized (clustered) states are defined as coexisting coherent (synchronized) and incoherent (unsynchronized) domains in an ensemble of interacting oscillators. We report these clustered states in experiments involving an ensemble of sixteen mercury beating heart (MBH) oscillators. These oscillators interact via resistors and are subjected to two different network schemes: 1) All to all and 2) Nonlocal. For the all to all network, the coupling strengths were inhomogeneously distributed, whereas for the nonlocal network scenario, each oscillator was coupled, with an identical coupling strength, with four of its nearest neighbors in either direction. For both of these network schemes, partially synchronized states results into grouping of these oscillators, wherein some oscillators are synchronized and rest are unsynchronized. For all to all

Research Article, Vector Biol J Vol: 2 Issue: 2

Impact of Ocimum Basilicum Leaf Essential Oil on The Survival and Behaviour of An Indian Strain of Dengue Vector, Aedes aegypti (L.)

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Abstract

Objective: *Aedes aegypti* (L.) is a well-known widely spread disease vector transmitting several diseases of concern. Current investigations were undertaken to discover the larvicidal and repellent potential of essential oil from the basil plant, *Ocimum basilicum* leaves against *Ae. aegypti* as a suitable and eco-safe alternate to chemical insecticides.

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Abstract

PSEUDOMONAS AERUGINOSA: ISOLATION, CHARACTERIZATION AND EVALUATION OF LARVICIDAL EFFICACY AGAINST AEDES AEGYPTI L.

Rajiv Kumar Shukla, Dr. Sarita Kumar* and Pushplata Tripathi

ABSTRACT

The present study investigates the bioactivity of Pseudomonas aeruginosa against the fourth instar larvae of Aedes aegypti. The bacterium was isolated from the soil samples collected from various parts of Delhi and characterized based on their biochemical and morphological characters. The identification of bacterium was carried out with the help of MALDI-TOF MS Biotyper which confirmed the bacterium as Pseudomonas aeruginosa. The mosquitocidal potential of the isolated bacteria was evaluated against early fourth instars of dengue vector, Aedes aegypti maintained in the laboratory under controlled conditions of 28 ± 1 °C and 80 ± 5 % RH with a photoperiod of 14h daylight/10h darkness. The bioassay was performed in accordance with the protocol described by World Health Organization which proved the significant larvicidal efficacy of Pseudomonas aeruginosa against early fourth instars of Ae. aegypti. The larval exposure to bacterial formulation for 24 h resulted in the respective LC50 and LC90 values of 5.58 and 12.80 mg/mL. The present study concludes that non-pathogenic bacteria present in the natural environment can be used as potential bio-control agents against the larvae of Aedes aegypti. Further studies are needed to identify the bioactive extracellular and intracellular metabolites of bacteria effective against dengue vector larvae.

Keywords: Pseudomonas aeruginosa, Aedes aegypti, larvicidal, MALDI-TOF.

[Full Text Article]

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BIOPROSPECTING XYLANASE ENZYMES FROM DIVERSE ECOLOGICAL HABITATS

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ABSTRACT

In order to exploit and improve the metabolic versatility of micro-organisms, the classical area of research has been to optimize the production of extra cellular enzymes for efficient degradation of substrates and selection of advanced and more active enzymes for enhanced enzyme yield. Microbial xylanases are important group of industrial enzymes that are used for various commercial purposes. Wide variety of bacteria in the environment permits screening for efficient xylanase producing strains to help overcome the current challenges. In an attempt to discover new xylanase producing strains, more than 600 actinomycete isolates representing varied ecological habitats were screened. By using birchwood xylan as substrate, diameter of zones of hydrolysis was measured and it ranged from 17-40 mm. Among the isolates tested, colonies 169, 126, and 202 along with the positive controls NRRL B-24314 (Streptomyces thermocoprophilus) and NRRL B-24916 (Streptomyces mexicanus) showing appreciable zones of clearance were selected for quantitative screening under the submerged state fermentation. Enzyme from respective colonies was partially purified by ammonium sulfate precipitation and dialysis. Enzyme activity ranged from 6.72- 15.0 IU/ml (in crude) and 11.15-25 IU/ml (in partially purified). The highest enzyme producer, colony 169 was further purified to homogeneity by ion exchange chromatography. Activity estimated in purified fraction was 32.12 IU/ml. Colony 169 showed maximum xylanase activity

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African Journal of Microbiology Research

Full Length Research Paper

Purification and molecular characterization of chitinases from soil actinomycetes

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Received 2 June, 2017; Accepted 4 July, 2017

Microbial extracellular chitinases are used in agriculture as effective biocontrol agents and in waste degradation, pharmaceutical and food industry. Actinomycetes are widely tapped group for production of extracellular chitinases. In the present study, approximately 260 actinomycetes were isolated from various ecological habitats was subjected to primary analyses and screened for production of chitinase by plate assay method. Diameter of zones of hydrolysis ranged from 8 to 16 mm. Based on the results, isolates 130, 194, 184, NRRLB 24916 (*Streptomyces mexicanus*) and NRRLB 16746 (*Streptomyces albidoflavus*, positive control) were selected for secondary screening and purification. Enzyme activity was estimated in crude cell free extract and partially purified samples. Activity ranged from 7.16 to 14.12 IU/ml (in crude extracts) and 12.1 to 23.10 IU/ml (in partially purified samples). In case of highest chitinase producing isolate 130, effect of various fermentation conditions (pH, temperature and substrate concentration) was studied in crude extract. Furthermore, complete purification of isolate 130 was done by column chromatography and the activity in purified fraction was found to be 32.12 IU/ml. The K_m and V_{max} values of the purified fractions for isolate 130 were 2.11 µg/ml/min and 53.11mg/ml respectively. This shows that the enzyme has high affinity for the substrate. SDS gel electrophoresis of the purified fraction showed presence of single band of approximately 65 to 70 kDa. Analyses of purified chitinase were done using MS/MS technique. N-terminal sequence corresponded to chitinase, the gene encodes a protein of 453 amino acid residues. Comparison of deduced amino acid sequence to other chitinases in the database indicated that enzyme showed 70% similarity with chitinase from *Streptomyces plicatus* and belongs to glycoside hydrolase family 18. Homology modeling showed that the enzyme was folded into a domain of $(\alpha/\beta)_8$ barrel structure. Identification of secondary structure was done by CD spectroscopy. Isolate 130 was capable of degrading biodegradable wastes such as crustacean shells.

Key words: Actinomycetes, extracellular chitinase, primary screening, secondary screening, purification, MS/MS analyses, homology modelling, protein structure, biodegradation.

INTRODUCTION

Chitinases are enzymes that hydrolyse the β-1,4 linkage of N-acetyl glucosamine present in chitin chains. Due to vast availability, low cost, high stability and productivity, microbial chitinase is attaining prominence for waste management, pest control in agriculture, and human health care (Das et al., 2015, 2016; Rathore and Gupta, 2015). Improving the yield of the enzyme and consequent cost reduction depends on the selection of strains, optimization of fermentation conditions, genetic improvement of strains and kinetic studies of enzyme (Andualem,

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Crystal structure of UDP-*N*-acetylglucosamine-enolpyruvate reductase (MurB) from *Mycobacterium tuberculosis*☆

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ARTICLE INFO

Keywords:
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NADPH

ABSTRACT

The biosynthesis of UDP-*N*-acetylmuramic acid (UDP-MurNAc) by reduction of UDP-*N*-acetylglucosamine-enolpyruvate (UDP-GlcNAc-EP) in an NADPH and FAD-dependent reaction in bacteria is one of the key steps in peptidoglycan biosynthesis catalyzed by UDP-*N*-acetylglucosamine-enolpyruvate reductase (MurB). Here, we present the crystal structure of *Mycobacterium tuberculosis* MurB (MtbMurB) with FAD as the prosthetic group at 2.0 Å resolution. There are six molecules in asymmetric unit in the form of dimers. Each protomer can be subdivided into three domains and the prosthetic group, FAD is bound in the active site between domain I and domain II. Comparison of MtbMurB structure with the structures of the *Escherichia coli* MurB (in complex with UDP-GlcNAc-EP) and *Pseudomonas aeruginosa* MurB (in complex with NADPH) showed all three structures share similar domain architecture and residues in the active site. The nicotinamide and the enol pyruvyl moieties are well aligned upon superimposition, both positioned in suitable position for hydride transfer to and from FAD. The comparison studies and MD simulations demonstrate that the two lobes of domain-III become more flexible. The substrates (NADPH and UDP-GlcNAc-EP) binding responsible for open conformation of MurB, suggesting that NADPH and UDP-GlcNAc-EP interactions are conformationally stable. Our findings provide a detail mechanism about the closed to open state by binding of NADPH and UDP-GlcNAc-EP induces the conformational changes of MurB structure that may trigger the MurB catalytic reaction.

1. Introduction

The growth of multidrug-resistant *Mycobacterium tuberculosis* (Mtb) has become an increasing global problem due to acquired resistance to the first and second line drugs [1]. To address the issues of multidrug resistance, discovering drugs with novel modes of action, targeting enzymes deemed specific and essential for the cell wall biogenesis in Mtb recommends a valid approach. Peptidoglycan represents vital constituent of the cell wall in most prokaryotic organisms which provides osmotic stability and defines the size and shape of bacterial cells [2]. Efforts have been made in recent years to study the importance of these enzymes in the peptidoglycan biosynthetic pathway with the hope that novel enzyme inhibitors might be found for these essential targets [3–5].

The cytoplasmic biosynthetic pathway leading to formation of peptidoglycan units involves six enzymes [6,7]. First, UDP-GlcNAc enolpyruvyl transferase, MurA catalyzes the formation of UDP-GlcNAc enolpyruvate by transferring enolpyruvate (UDP-GlcNAc-EP) from phosphoenolpyruvate followed by UDP-GlcNAc enolpyruvate reductase (EC:1.3.1.98, MurB) reaction which catalyzes the reduction of UDP-GlcNAc-EP to form UDP-*N*-acetylmuramic acid (UDP-MurNAc). Then a series of Mur ligases (MurC-F) catalyze the sequential addition L-Alanine, D-Glutamic acid, meso-diaminopimelic and the dipeptide D-Alanine-D-Alanine to UDP-MurNAc, to form the final UDP-MurNAc-pentapeptide. MurB enzyme is essential for the viability of bacterial cells [7] and the absence of a homologue in eukaryotic cells makes MurB

Abbreviations: UDP-GlcNAc-EP, UDP-*N*-acetylglucosamine-enolpyruvate; UDP-MurNAc, UDP-*N*-acetylmuramic acid; FAD, Flavin Adenine Dinucleotide; NADPH, Nicotinamide Adenine Dinucleotide Phosphate; MtbMurB, *Mycobacterium tuberculosis* UDP-*N*-acetylglucosamine-enolpyruvate reductase; EcMurB, *Escherichia coli* UDP-*N*-acetylglucosamine-enolpyruvate reductase; PaMurB, *Pseudomonas aeruginosa* UDP-*N*-acetylglucosamine-enolpyruvate reductase

☆ Databases: The atomic coordinates and structure factors have been deposited in the Protein Data Bank, www.pdb.org (PDB ID code 5JZX).

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1570-9639/

Isolation and characterization of bacteriophages from India, with lytic activity against *Mycobacterium tuberculosis*

Authors: Urmi Bajpai, Abhishek Kumar Mehta, Kandasamy Eniyan, Avni Sinha, Ankita Ray, Simran Virdi, Shazeb Ahmad, Aridni Shah, ... SHOW ALL | AUTHORS INFO & AFFILIATIONS

Publication: Canadian Journal of Microbiology • 15 March 2018 • https://doi.org/10.1139/cjm-2017-0387

Abstract

Bacteriophages are being considered as a promising natural resource for the development of alternative strategies against mycobacterial diseases, especially in the context of the wide-spread occurrence of drug resistance among the clinical isolates of *Mycobacterium tuberculosis*. However, there is not much information documented on mycobacteriophages from India. Here, we report the isolation of 17 mycobacteriophages using *Mycobacterium smegmatis* as the bacterial host, where 9 phages also lyse *M. tuberculosis* H37Rv. We present detailed analysis of one of these mycobacteriophages — PDRPv. Transmission electron microscopy and polymerase chain reaction analysis (of a conserved region within the TMP gene) show PDRPv to belong to the *Siphoviridae* family and B1 subcluster, respectively. The genome (69 110 bp) of PDRPv is circularly permuted double-stranded DNA with ~66% GC content and has 106 open reading frames (ORFs). On the basis of sequence similarity and conserved domains, we have assigned function to 28 ORFs and have broadly categorized them into 6 groups that are related to replication and genome maintenance, DNA packaging, virion release, structural proteins, lysogeny-related genes and endolysins. The present study reports the occurrence of novel antimycobacterial phages in India and highlights their potential to contribute to our understanding of these phages and their gene products as potential antimicrobial agents.

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Review Article

Microwave Assisted Synthesis of Spiro Heterocyclic Systems: A Review

Author(s): Pankaj Khanna, Leena Khanna, Sean J. Thomas, Abdullah M. Asiri and Siva S. Panda*

Volume 22, Issue 1, 2018

Page: [67 - 84] **Pages:** 18

DOI: 10.2174/1385272821666170818161517

Price: $65

Abstract

Background: Microwave irradiation has emerged as a useful synthetic strategy for chemists and drug developers due to enhanced yields, regioselectivity, and faster reaction times. One area of importance in its practice has been the design of spiro compounds, which possess great interest on account of their natural occurrence and medicinal capabilities. The increasingly large number of these scaffolds and unlimited amount of methodologies utilized in their preparation have made them good candidates for the microwave assisted approach.

Conclusion: Therefore, this review emphasizes the use of microwave irradiation in the synthesis of spiro heterocyclic compounds.

Keywords: Spiro compounds, heterocycles, microwave, green synthesis.

Graphical Abstract

NO ACCESS

An analysis of replenishment model of deteriorating items with ramp-type demand and trade credit under the learning effect

Archana Sharma, Usha Sharma and Chaman Singh

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Abstract

Effective management and control strategies are prerequisites in order to optimise inventory related decisions. Robust replenishment model can reduce overall inventory cost and increase financial surplus for the organisation. Adoption of trade credit strategy for deteriorating items provides economic benefits to the retailer (buyer) in settling the account for the fixed period and boosts the sales of the organisation. Therefore, in this proposed model trade credit is introduced and demands pattern follows ramp-type which is quadratic function of time for decaying items. Shortages are allowed and partially backlogged where the backlogging rate is dependent of waiting time. The inflation factor is also considered to propose realistic environment. Additionally, this study also considered the cost components which are followed by learning curve to improve the total inventory cost with strategic scheduling. Finally, the model is analysed through numerical examples and the sensitivity analysis is performed to test the robustness of the model.

Keywords

ramp-type demand, partial backlogging, learning effect, trade credit, inflation

Previous Article

Next Article

Emamectin benzoate: Potential larvicide and antifeedant agent against cotton Boll worm Helicoverpa armigera (Lepidoptera: Noctuidae)

PDF

Published Jun 1, 2018

DOI https://doi.org/10.31018/jans.v10i2.1738

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Abstract

Helicoverpa armigera, a global polyphagous pest, attacks a wide variety of crops causing huge agricultural loss. Overuse of conventional insecticides for *Helicoverpa* control has made *Helicoverpa* resistant to insecticides leading to more severe attacks on crops diverting interest of researchers to explore alternate control agents. Present study investigates the cidal and antifeedant potential of Emamectin benzoate; a semi-synthetic avermectin derived from the soil actinomycetes, *Streptomyces avermitilis;* against early IV instars of *H. armigera*. Larvae were fed on the castor leaf discs (3.5 cm diameter) dipped in different concentrations of Emamectin benzoate; ranging from 0.05 µg/mL-1.5 µg/mL. The leaf disc areas were measured pre-and post-larval feeding to estimate the antifeedant potential of compound. The effect of feeding was also assessed on the survival of larvae by scoring the larval mortality till 96 h. Our investigations showed significant larvicidal potential of Emamectin benzoate against *H. armigera* revealing respective LC_{50} values of 0.26 µg/mL, 0.095 µg/mL, 0.043 µg/mL and 0.027 µg/mL after 24, 48, 72 and 96 h feeding. Furthermore, a remarkable decrease of 93.59% was observed in larval feeding potential indicating significant antifeedant efficacy of Emamectin benzoate. A strong correlation between antifeedant index and the Emamectin benzoate concentration resulted in 1.48-fold index reduction with a decrease in concentration. Our results demonstrated efficacy of Emamectin benzoate as an effectual larvicidal and antifeedant agent against *H. armigera*. Employing selective insecticide can tackle issues of pest resistance and pest resurgence after ascertaining in the fields as *Helicoverpa* control agent and negating impact on non-target organisms.

Molecular and Cellular Biology >
Volume 38, 2018 - Issue 2

Research Article

Sld5 Ensures Centrosomal Resistance to Congression Forces by Preserving Centriolar Satellites

Manpreet Kaur, Raksha Devi, Tanushree Ghosh, Md Muntaz Khan, Praveen Kumar, Priyanka, ...show all

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Download citation

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Study of effect of various temperatures on the abundance of ammonia oxidizing archaea and bacteria

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Keywords: Ammonia, amoA gene, Archaea, Bacteria, Recirculating system, Temperature

Abstract

Temperature plays significant role in the oxidation of ammonia in filtration units of recirculating aquaculture system. The impact of temperature on the abundance of ammonia oxidizing archaea and bacteria, and the expression of ammonia oxidizing gene (amoA) at specific temperature was evaluated. The broken earthen pot pieces used as filter bed materials of recirculating system, showing the presence of microorganisms were introduced in glass containers (5 pieces/5l) filled with synthetic wastewater and exposed to four different temperatures of 10, 20, 30 and 40°C for 40 days. The ammonia oxidation rate was minimum at 10°C. In 20, 30 and 40°C treatments, 99% ammonia was reduced on day-18, 8 and 18, respectively compared to the initial day. Fresh ammonium chloride (2 mM) was added twice to maintain the ammonia concentration in all treatments, except 10°C one. Nitrite-N level was < 1 mg/l at 10°C. The level was highest on day-22 at 20° and 40°C and on day-12 at 30°C. The nitrification was 10 days delayed at 20°C and 40°C compared to 30°C treatment. Concentration of nitrate-N was lowest at 10°C. Highest concentration of nitrate-N was observed on day-40 at 20°C and 40°C and day-26 at 30°C. Highest copy number of bacterial amoA was recorded at 30°C (2.59×107) followed by 20°C (4.08×106), 40°C (1.45×106) and 10°C (5.664×103). Archaeal amoA was highest at 30°C (7.47×103) followed by 40°C (2.98×102) and 20°C (46.8) treatments. Hence it may be concluded that 30°C temperature was optimum for the efficient and faster oxidation of ammonia in the present recirculating system.

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Articles

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Original Articles

Estimating the parameter of selected uniform population under the squared log error loss function

K. R. Meena, Mohd. Arshad & Aditi Kar Gangopadhyay

Pages 1679-1692 | Received 15 Sep 2016, Accepted 25 Apr 2017, Accepted author version posted online: 09 May 2017, Published online: 27 Sep 2017

https://doi.org/10.1080/03610926.2017.1324986

JOURNAL ARTICLE

Cellular and molecular basis of heavy metal-induced stress in ciliates

Sripoorna Somasundaram, Jeeva Susan Abraham, Swati Maurya, Seema Makhija, Renu Gupta, Ravi Toteja

Current Science, Vol. 114, No. 9 (10 May 2018), pp. 1858-1865 (8 pages)

https://www.jstor.org/stable/26495334

Plant Biology / Volume 20, Issue 3 / p. 546-554

Research Paper

Floral contrivances and specialised pollination mechanism strongly influence mixed mating in *Wrightia tomentosa* (Apocynaceae)

C. Barman, V. K. Singh, S. Das, R. Tandon

First published: 13 January 2018
https://doi.org/10.1111/plb.12690
Citations: 9

Abstract

- Reproductive success of a plant species is largely influenced by the outcome of mating pattern in a population. It is believed that a significantly larger proportion of animal-pollinated plants have evolved a mixed-mating strategy, the extent of which may vary among species. It is thus pertinent to investigate the key contributors to mating success, especially to identify the reproductive constraints in depauperate populations of threatened plant species.
- We examined the contribution of floral architecture, pollination mechanism and breeding system on the extent of outcrossing rate in a near-threatened tree species, *Wrightia tomentosa*. The breeding system was ascertained from controlled pollination experiments. In order to determine outcrossing rate, 60 open-pollinated progeny were analysed using an AFLP markers.
- Although the trees are self-compatible, herkogamy and compartmentalisation of pollen and nectar in different chambers of the floral tube effectively prevent spontaneous autogamy. Pollination is achieved through specialised interaction with moths. Differential foraging behaviour of settling moths and hawkmoths leads to different proportions of geitonogamous and xenogamous pollen on the stigma. However, most open-pollinated progeny were the result of xenogamy (outcrossing rate, tm = 0.68).
- The study shows that floral contrivances and pollination system have a strong influence on mating pattern. The differential foraging behaviour of the pollinators causes deposition of a mixture of self- and cross-pollen to produce a mixed brood. Inbreeding depression and geitonogamy appear to play a significant role in sustaining mixed mating in this species.

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JOURNAL ARTICLE

Relative contribution of reproductive attributes to the density-dependent effects on fruit-set

Vineet Kumar Singh, Chandan Barman, Divya Mohanty, Rajesh Tandon

AoB PLANTS, Volume 10, Issue 2, April 2018, ply019, https://doi.org/10.1093/aobpla/ply019
Published: 13 March 2018 **Article history**

Abstract

Reproductive success of a plant species can be affected by the distribution pattern of its conspecifics in a small population. Besides the low mate availability, the dynamics of breeding system and pollination mechanism may also contribute to low fruit-set in such populations. We examined the relative contribution of these reproductive attributes on fruit-set across the contrasting distribution pattern (denser vs. sparser plots) in two isolated natural populations of a near-threatened tree species, *Anogeissus sericea* var. *nummularia*. Although flowers in the species are of generalist type, the narrow stigmatic surface appears to impose a requirement for a specialist pollinator. Pollination in the tree species is mediated only by the flies. The trees exhibit partial selfing and suffer from strong inbreeding depression at the early life-history stages of the selfed progeny. We recorded significant difference between the denser and sparser plots in terms of inflorescence visits per tree, and the number of trees covered in a bout by the pollinators. Moreover, tree density showed a strong positive correlation with fruit-set. Besides the requirement of having proximity among the conspecifics to facilitate pollinator movement, pollen quality also seemed to be a crucial attribute in the reproductive success of the tree species. It is inferred that the mating pattern and fecundity of plants in small and isolated populations are significantly influenced by the extent of sexual incompatibility and magnitude of their dependence on pollinators.

Keywords: Inbreeding depression, myophily, partial self-compatibility, reproductive biology
Subject: Plant-Animal Interactions, Reproductive Biology
Issue Section: Research article

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http://web.icf.ro/rrch/

Rev. Roum. Chim.,
2018, *63*(4), 299-307

HETEROLEPTIC METAL(II) COMPLEXES OF CURCUMIN AND 2,2'-BIPYRIDINE: SYNTHESIS, CHARACTERIZATION, MOLECULAR MODELING AND PRELIMINARY ANTIMICROBIAL INVESTIGATION

Shyam LAL,[a] Mukesh Chandra JOSHI[b], Sunita HOODA[a] and Vikrant KUMAR[a]*

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[b] Department of Chemistry, Motilal Nehru College, University of Delhi, Delhi-110021, India

Received September 18, 2017

Three mononuclear metal complexes [(curcu)M(bpy)]Cl **1-3** of nickel[II] **(1)**, copper[II] **(2)** and zinc[II] **(3)** derived from curcumin (curcu) and 2,2'-bipyridine (bpy) have been isolated and characterized by analytical and spectral methods, *viz.* elemental analyses, molar conductance, magnetic susceptibility measurements, mass spectrometry, IR, UV-visible spectrometry and molecular modeling studies. IR spectral frequencies exhibited curcumin and 2,2'-bipyridine both behave as bidentate ligand and coordinate to metal ion through the carbonyl oxygen and nitrogen atoms respectively. All the complexes showed molar conductance corresponding to 1:1 electrolytic nature. Ni^{II} and Cu^{II} complexes were confirmed possessing square planar geometry however Zn^{II}, tetrahedral. Metal complexes along with curcumin and 2,2'-bipyridine were examined against the opportunistic pathogens. The results obtained indicate that metal complexes have reasonable antimicrobial potential.

INTRODUCTION

Naturally occurring phenolic pigment, Curcumin; chemically, [1,7-bis(4-hydroxyl-3-methoxyphenyl)-1,6-heptadiene-3,5-dione] is a major component of the Curcuma species. It is obtained from the rhizome of *Curcuma longa* Linn.,[1] which is commonly used as a yellow coloring and flavoring agent in foods. Recent studies have shown that curcumin possesses a specific property of binding to metals and as a multipotent agent for combating to potent biological as well as pharmacological activities.[2-8] Thus, for the past decade curcumin as a ligand has been the subject of great interest in modern coordination chemistry.[9-12] Curcumin has a specific chemical motif, a bis-α,β-unsaturated-β-diketone which exhibits keto-enol tautomerism (**Figure 1**). The virtue of coordination property of curcumin leads to tailoring a rational drug design including a number of metal complexes and scavenge the active free-radicals which makes it a more potent bioactive agent *viz.* as antimicrobial agent, anticarcinogenic, antialzheimer, used in catalysis, radiodiagnostic and several other applications.[13-17] Research analysis postulates that the biological properties of curcumin are significantly enhanced upon coordination with metal ion.[18-19] On the other hand, heterocyclic compounds such as pyridine, phenanthroline, bipyridine, and their respective derivatives etc. have been shown extended biological activities when coordinated with metal ion.[20-21] Various enzymes, vitamins, proteins and other life regulating biomoleeules, most of which consist of N- and/or O- containing heteroatoms which are the key of chelation with transition metal ions.

Thus, specific biological and pharmacological role of curcumin, bypiridine and various role of transition metal ions in daily life, could have made

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Journal of Photochemistry and Photobiology A: Chemistry
Volume 364, 1 September 2018, Pages 811-818

A highly selective sensor for Cu^{2+} and Fe^{3+} ions in aqueous medium: Spectroscopic, computational and cell imaging studies

Shyam Lal [a], Satish Kumar [b], Sunita Hooda [a], Pramod Kumar [c]

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https://doi.org/10.1016/j.jphotochem.2018.07.021

Abstract

A rationally designed chemosensor L1 (2-(2-amino-4,5-dihydrothiazol-4-yl)-5,5-dimethylcyclohexane-1,3-dione) is capable for the detection of biologically important Cu^{2+} and Fe^{3+} ions. The observable change in absorbance and emission in HEPES buffer solution and binding parameters display notable sensing ability of Cu^{2+} and Fe^{3+} ions. From Job's plot and ESI-MS spectra, 1:1 stoichiometric complexation with Cu^{2+} and Fe^{3+} ions have been established. The chemosensor was also utilized to develop logic gate by reversibility cycles for Fe^{3+} ion by EDTA. In addition, complex formation between the receptor and Cu^{2+}/Fe^{3+} ion was investigated by spectroscopically and computational studies. The cell imaging study indicated that L1 is highly efficient for the detection of Fe^{3+} ion in live cells. The simple synthetic route, multi-stimuli response, regenerative action and solution visualization of the proposed chemosensor potentially make it as excellent sensor for real samples.

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Protective effects of *Aporosa octandra* bark extract against D-galactose induced cognitive impairment and oxidative stress in mice

Siva S. Panda • Adel S. Girgis • Atish Prakash • ... ElSayed M. Shalaby • Nehmedo G. Fawzy • Subhash C. Jain • Show all authors

Open Access • Published: November 30, 2018 • DOI: https://doi.org/10.1016/j.heliyon.2018.e00951 •

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Abstract

Aporosa octandra (Buch.-Ham. ex D.Don) Vickery is a native species of India. Different parts of the plant are used for the medicinal purpose by the tribal peoples of south-eastern part of India. However, the biological properties of *A. octandra* have not been studied well. The extracts obtained from the bark of *A. octandra* were evaluated to determine their protective effect on cognitive impairment and oxidative stress in mice induced by D-galactose using the standard protocol. Different dosages of extract **AOE-4** (100, 200, and 300 mg/kg, p.o.) were administered to mice, which were previously treated for six weeks with D-galactose (100 mg/kg s.c.). The D-galactose-induced mice showed significantly impaired cognitive behavior, i.e., oxidative defense, compared to the sham group. Six weeks of treatment with *A. octandra* extract **AOE-4** (100, 200 and 300 mg/kg, p.o.) considerably improved the cognitive behavior and oxidative impairment of mice compared to the control alone (D-galactose). For the phytochemical investigation, the bark of *A. octandra* was successively extracted with dichloromethane and methanol. The chemical constituents of *A. octandra* were isolated by multiple column chromatography and characterized by different spectral analyses. (*R*)-Coclaurine (**AO-5**), an alkaloid, was isolated along with two other compounds from the **AOE-4** extract; three more compounds were also isolated from the **AOE-1** extract of the bark of *A. octandra*. All the compounds were isolated for the first time from the bark of *A. octandra*, and their structures were established by detailed spectral studies. The structure of compound **AO-5** was also investigated and confirmed by X-ray diffraction and DFT studies. This study highlights the protective effect of *A. octandra* bark extract against D-galactose-induced biochemically dysfunction in mice. (*R*)-Coclaurine (**AO-5**) was isolated as one of the major components of *A. octandra* bark from **AOE-4** extract; compound could be further evaluated for the development of new potential

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Social centrality using network hierarchy and community structure

Rakhi Saxena, Sharanjit Kaur & Vasudha Bhatnagar

Data Mining and Knowledge Discovery **32**, 1421–1443 (2018) | Cite this article

Abstract

Several centrality measures have been formulated to quantify the notion of 'importance' of actors in social networks. Current measures scrutinize either local or global connectivity of the nodes and have been found to be inadequate for social networks. Ignoring hierarchy and community structure, which are inherent in all human social networks, is the primary cause of this inadequacy. Positional hierarchy and embeddedness of an actor in the community are intuitively crucial determinants of his importance. The theory of social capital asserts that an actor's importance is derived from his position in network hierarchy as well as from the potential to mobilize resources through intra-community (bonding) and inter-community (bridging) ties. Inspired by this idea, we propose a novel centrality measure social centrality (SC) for actors in social networks. Our measure accounts for—(1) an individual's propensity to socialize, and (2) his connections within and outside the community. These two factors are suitably aggregated to produce social centrality score. Comparative analysis of SC measure with classical and recent centrality measures using large public networks shows that it consistently produces more realistic ranking of nodes. The inference is based on the available ground truth for each tested networks. Extensive analysis of rankings delivered by SC measure and mapping with known facts in well-studied networks justifies its effectiveness in diverse social networks. Scalability evaluation of SC measure justifies its efficacy for real-world large networks.

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Bandwidth Efficient Broadcast Protocols in MANETs: A Review

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PAPER

Structural and optical properties of electrochemically deposited ZnO nanorods by using graphene oxide and ITO as substrate material: a comparative study

Chetna[1], Shani Kumar[1,2], A Garg[2], A Chowdhuri[3], A Jain[4] and A Kapoor[1]

Published 15 August 2018 • © 2018 IOP Publishing Ltd

Materials Research Express, Volume 5, Number 9

Citation Chetna *et al* 2018 *Mater. Res. Express* 5 095024

DOI 10.1088/2053-1591/aad7a5

References

+ Article and author information

Abstract

The present work reports the comparative study of structural and optical properties of ZnO Nanorods grown on Graphene Oxide (GO) and ITO. For this purpose, GO has been successfully synthesized via Hummer's method while electrochemical method has been used for the synthesis of ZnO nanorods. The structural and optical properties of the as-grown samples were studied using FESEM, EDX, XRD, FTIR and Raman spectroscopy. An improvement in density of ZnO nanorods with hexagonal structure is indicated by the FESEM micrographs. XRD analysis confirms that crystal structure of ZnO nanorods is not significantly disturbed by GO, in addition a reduction in lattice strain has been observed for the samples grown on GO. Raman and FTIR spectroscopy has also been performed to probe the structural integration of ZnO crystal structure and the results are in consensus with that of XRD analysis. The study indicates the potential application of GO as substrate material for ZnO nanorods based devices.

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PAPER

Structural and optical properties of electrochemically deposited ZnO nanorods by using graphene oxide and ITO as substrate material: a comparative study

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Materials Research Express

PAPER

Sonication effect on graphene oxide (GO) membranes for water purification applications

Shani Kumar[1,3], Amit Garg[1] and Arijit Chowdhuri[2]

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Materials Research Express, Volume 6, Number 8

Citation Shani Kumar *et al* 2019 *Mater. Res. Express* **6** 085620

DOI 10.1088/2053-1591/ab1ffd

Abstract

Recent literature indicates the use of graphene oxide (GO), derived from 2D material graphene as being the active material in membranes for water purification and desalination applications, mainly because of it exhibiting unique properties including high mechanical strength, excellent chemical stability, strong hydrophilicity, and excellent anti-fouling properties (Dreyer *et al* 2010 *Chem. Soc. Rev.* **39** 228, Dikin *et al* 2007 *Nature* **448** 457 and Koinuma *et al* 2012 *J. Phys. Chem. C* **116** 19822). In the current study, graphene oxide has been synthesized using well established Hummer's method and thereafter utilized as membranes on porous PVDF (polyvinylidene fluoride) support for water purification applications. The effect of sonication time (5 to 60 min) during preparation of graphene oxide membrane has been investigated vis-à-vis water purification abilities of the developed membranes. Related characterizations like dynamic light scattering (DLS), Raman

Published: 27 September 2018

Circular restricted three-body problem when both the primaries are heterogeneous spheroid of three layers and infinitesimal body varies its mass

Abdullah A. Ansari, Ziyad Ali Alhussain & Sada Nand Prasad

Journal of Astrophysics and Astronomy **39**, Article number: 57 (2018) | Cite this article

Abstract

The circular restricted three-body problem, where two primaries are taken as heterogeneous oblate spheroid with three layers of different densities and infinitesimal body varies its mass according to the Jeans law, has been studied. The system of equations of motion have been evaluated by using the Jeans law and hence the Jacobi integral has been determined. With the help of system of equations of motion, we have plotted the equilibrium points in different planes (in-plane and out-of planes), zero velocity curves, regions of possible motion, surfaces (zero-velocity surfaces with projections and Poincaré surfaces of section) and the basins of convergence with the variation of mass parameter. Finally, we have examined the stability of the equilibrium points with the help of Meshcherskii space–time inverse transformation of the above said model and revealed that all the equilibrium points are unstable.

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An EOQ Model for Deteriorating Items with Selling Price Dependent Exponential Demand for Time Varying Holding and Deterioration Costs

AUTHORS

Sachin Kumar Verma

Mohd. Rizwanullah

Chaman Singh

DOI: https://doi.org/10.14419/ijet.v7i4.41.24294

PUBLISHED: 2018-12-19

Keywords: Deteriorating items, price and time dependent demand, shortages and time varying holding cost, Lead time.

ABSTRACT Research investigation of the past few decades shown that the researchers developed economic order quantity (EOQ) model for perishable items under constant deterioration and constant demand. Though, in actual practice it is not true. This paper involved a representation of an inventory control model, in which perishable items has been taken with a price as well as an exponential dependent demand. The measured items in the model are deteriorating in nature based on time dependent deterioration rate. In the earlier studies the holding cost often treated as a constant, which is not suited to the most of the practical life situations. In real practical situation some kind of items treat holding cost is a function of time, which is increase as the time increases. In this paper, a model is developed which included the time dependent linear holding cost. We have achieved the estimated optimal solution under the given assumption according to the situation. A numerical example is presented to demonstrate the model and the sensitivity analysis of various parameters is approved out for the validation of the proposed method.

REFERENCES

NO ACCESS

A production inventory model with selling price and stock sensitive demand under partial backlogging

Deo Datta Aarya and Mukesh Kumar

Published Online: March 29, 2018 • pp 350-363 • https://doi.org/10.1504/IJMOR.2018.090802

ABOUT

Abstract

In the proposed paper we develop an inventory model for instantaneous deteriorating items with multi variate function of demand rate. Generally, we observe that the demand for any product depends on so many factors, out of which the available stock and selling price are the main factors. So in this paper we have assumed that the demand rate is a function of stock and selling price. The production rate is taken as a function of demand rate. The shortages are allowed and it is assumed that the occurring shortages will be backlogged for which the backlogging rate is a function of waiting time. The numerical example and sensitivity exploration with respect to various parameters are also cited to illustrate the study.

Keywords

inventory, shortages and partial backlogging, multi variate demand rate, deterioration rate, production

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RESEARCH ARTICLE

Susceptibility Status of *Aedes aegypti* L. Against Different Classes of Insecticides in New Delhi, India to Formulate Mosquito Control Strategy in Fields

Roopa Rani Samal, Sarita Kumar*
Department of Zoology, Acharya Narendra Dev College, University of Delhi, Kalkaji, Govindpuri, New Delhi 110019, India

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RESEARCH ARTICLE

Effects of *Achyranthes aspera* Extracts on the Survival and Midgut Histo-architecture of *Aedes aegypti* L. Early IV Instars

Aarti Sharma[1], **Sarita Kumar**[2, *], **Pushplata Tripathi**[1]

[1] School of Sciences, Indira Gandhi National Open University, Maidan Garhi, New Delhi 110068, India

[2] Department of Zoology, Acharya Narendra Dev College, University of Delhi, Kalka Ji, India

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Original Articles

Growth regulatory and growth inhibitory effects of *Thevetia neriifolia* stem extracts on *Helicoverpa armigera* (Lepidoptera: Noctuidae)

Monika Mishra, Kamal Kumar Gupta & Sarita Kumar

Pages 895-914 | Received 05 Apr 2017, Accepted 24 Aug 2018, Published online: 28 Oct 2018

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physica status solidi (a) / Volume 215, Issue 14 / 1800141

Original Paper

Modelling of Pinning-Depinning Reversal Mechanism in Ion-Irradiated Co/Al_2O_3 Thin Films

Rajan Goyal, Rekha Gupta, Ambika Negi, Kandasami Asokan, Dinakar Kanjilal, Subhalakshmi Lamba, Subramanian Annapoorni

First published: 12 June 2018
https://doi.org/10.1002/pssa.201800141
Citations: 1

Abstract

Present study reports the pinning–depinning mechanism in Co embedded Al_2O_3 matrix subjected to Ar^+ ion irradiations. Angular variation studies of the scaled coercivity are carried out and a comparison to existing theoretical models indicates that the dominant reversal mechanism is due to pinning. The origin of pinning is attributed to the displacement of Co atoms from their lattice sites, as a result of ion bombardment. The Monte Carlo simulations suggest that the observed magnetic behavior is well explained by pinning induced strain anisotropy in the system.

Conflict of Interest

The authors declare no conflict of interest.

Published: 21 May 2018

Polarization dependent charge control model for microwave performance assessment of AlGaN/GaN/AlGaN double heterostructure HEMTs

Nisha Chugh, Monika Bhattacharya, Manoj Kumar, S. S. Deswal & R. S. Gupta

Journal of Computational Electronics **17**, 1229–1240 (2018) | Cite this article

Abstract

An accurate polarization dependent charge control-based analytical model is proposed for microwave performance assessment of $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ double heterostructure high electron mobility transistors (DH-HEMTs) in terms of current, transconductance, gate capacitances and cutoff frequency. An analytical expression correlating the sheet carrier concentration in the two 2DEGs formed at the upper and lower heterointerfaces of a DH-HEMT is obtained. AlGaN/GaN/AlGaN DH-HEMTs are found to exhibit superior RF performance as compared to its single heterostructure counterpart in terms of higher drain current, improved transconductance, higher gate capacitance and higher unity-gain cutoff frequency. This improvement in the DH-HEMT is mainly attributed to the formation of two 2DEGs (at top and the bottom heterointerface) as compared to the single 2DEG in a SH-HEMT. The variation of drain current with drain voltage and with gate voltage of AlGaN/GaN SH-HEMTs and AlGaN/GaN/AlGaN DH-HEMTs is obtained analytically and found to agree reasonably well with that obtained using ATLAS 2D device simulation, thereby validating the proposed model.

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Abstract

LARVICIDAL ACTIVITIES OF PETROLEUM ETHER EXTRACTS OF DIFFERENT FRUIT PEEL WASTES AGAINST AN INDIAN STRAIN OF FILARIAL VECTOR, CULEX QUINQUEFASCIATUS SAY (DIPTERA: CULICIDAE)

Shrankhla and Sarita Kumar*

ABSTRACT

Objective: The larvicidal activity of the petroleum ether extracts of different fruit peels was assessed against the early fourth instar of Culex quinquefasciatus (Cx. quinquefasciatus). Methods: Petroleum ether extracts of peels of six common fruits were prepared and evaluated against early fourth instar larvae of Cx. quinquefasciatus using WHO standard procedure. The results were statistically analyzed to explore the most efficient extract. Results: Out of the six extracts, the Citrus sinensis and Mangifera indica peel extracts were found the most effective. Other tested fruit peel extracts resulted in 10-80% larval mortality after 24 to 48 hours of exposure. The larvicidal bioassays with C. sinensis resulted in LC50 and LC90 values were 31.345 ppm and 75.313 ppm, respectively as compared to high LC50 and LC 90 values of 195.97 ppm and 633.05 ppm obtained with M. indica. Conclusions: The petroleum ether extract of C. sinensis peels was found as the most effective extract against early fourth instar of Cx. quinquefasciatus amongst the other tested fruit peel extracts. Further investigations are needed to identify the bioactive component and formulate control strategies.

Keywords: Citrus sinensis, Culex quinquefasciatus, Fruit peels, Larvicidal potential, Mangifera indica.

[Full Text Article]

Review

> Artif Cells Nanomed Biotechnol. 2018;46(sup1):1210-1220.
doi: 10.1080/21691401.2018.1449118. Epub 2018 Mar 13.

Role of gold and silver nanoparticles in cancer nano-medicine

Heerak Chugh [1], Damini Sood [1], Ishita Chandra [1], Vartika Tomar [1], Gagan Dhawan [2], Ramesh Chandra [1] [3]

Affiliations + expand

PMID: 29533101
DOI: 10.1080/21691401.2018.1449118

Abstract

Development of nanoparticles (NPs) as a part of cancer therapeutics has given rise to a new field of research - cancer nanomedicine. In comparison to traditional anti-cancer drugs, NPs provide a targeted approach which prevents undesirable effects. In this communication, we have reviewed the role of gold and silver NPs (AgNPs) in the cancer nanomedicine. The preparation of gold NPs (AuNPs) and AgNPs can be grouped into three categories - physical, chemical and biological. Among the three approaches, the biological approach is growing and receiving more attention due to its safe and effective production. In this review, we have discussed important methods for synthesis of gold and AgNPs followed by techniques employed in characterization of their physicochemical properties, such as UV-visible spectroscopy, electron microscopy (TEM and SEM) and size and surface analysis (DLS). The mechanism of formation of these NPs in an aqueous medium through various stages - reduction, nucleation and growth has also been reviewed briefly. Finally, we conclude our review with the application of these NPs as anti-cancer agents and numerous mechanisms by which they render cancer cell toxicity.

Keywords: Nanoparticles; cancer; cancer nanomedicine; gold

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Aims and Scope of the Journal

The Delhi University Journal of Undergraduate Research and Innovation, a peer-reviewed, open access, e-journal with an ISSN: 2395-2334, an initiative of University of Delhi and the first of its kind for reporting quality research at the undergraduate level in India. It has been instrumental in encouraging young minds to develop creative as well as analytical thinking abilities and inculcating a research culture at the undergraduate level. The Journal provides an apt platform for reporting significant findings of research at the undergraduate level for both college teachers

Article

A concise synthesis of 2-alkenyl-3-phenyl-4H-chromen-4-ones via novel C-C bond formation using sulfone as potential intermediate

Jul 2018 · Indian Journal of Chemistry -Section B · Indian Journal of Chemistry -Section B

Leena Khanna Pankaj Khanna
Subhash C Jain

OXFORD ACADEMIC

Monthly Notices
of the Royal Astronomical Society

Royal Astronomical Society

Article Navigation

JOURNAL ARTICLE

Geometry of the Large Magellanic Cloud using multiwavelength photometry of classical Cepheids

Sukanta Deb, Chow-Choong Ngeow, Shashi M Kanbur, Harinder P Singh, Daniel Wysocki, Subhash Kumar

Monthly Notices of the Royal Astronomical Society, Volume 478, Issue 2, August 2018, Pages 2526–2540, https://doi.org/10.1093/mnras/sty1124

Published: 03 May 2018 **Article history**

ABSTRACT

We determine the geometrical and viewing angle parameters of the Large Magellanic Cloud (LMC) using the Leavitt law based on a sample of more than 3500 common classical Cepheids (FU and FO) in optical (V, I), near-infrared (JHK_s), and mid-infrared ($[3.6]$ μm and $[4.5]$ μm) photometric bands. Statistical reddening and distance modulus free from the effect of reddening to each of the individual Cepheids are obtained using the simultaneous multiband fit to the apparent distance moduli from the analysis of the resulting Leavitt laws in these seven photometric bands. A reddening map of the LMC obtained from the analysis shows good agreement with the other maps available in the literature. Extinction-free distance measurements along with the information of the equatorial coordinates (α, δ) for individual stars are used to obtain the corresponding Cartesian coordinates with respect to the plane of the sky. By fitting a plane solution of the form $z = f(x, y)$ to the observed three-dimensional distribution, the following viewing angle parameters of the LMC are obtained: inclination angle $i = 25.^\circ 110 \pm 0.^\circ 365$, and position angle of line of nodes $\theta_{\rm lon} = 154.^\circ 702 \pm 1.^\circ 378$. On the other hand, modelling the observed three-dimensional distribution of the Cepheids as a triaxial ellipsoid, the following values of the geometrical axes ratios of the LMC are obtained: 1.000 ± 0.003: 1.151 ± 0.003: 1.890 ± 0.014 with the viewing angle parameters: inclination angle of $i = 11.^\circ 920 \pm 0.^\circ 315$ with respect to the longest axis from the line of sight and position angle of line of nodes $\theta_{\rm lon} = 128.^\circ 871 \pm 0.^\circ 569$. The position angles are measured eastwards from north.

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Adoption of Free and Open Source Software in India

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Abstract

The significance and robustness of Free and Open Source Software (FOSS) are now well known at stages of development as well as deployment. It's natural to assume that the products of FOSS to be deployed as a preference over the commercially available propriety software. However, proprietary software not only exists but is also thriving. The present paper looks into the aspect of adoption of FOSS, with special emphasis to India. The two natural arena for adoption- Governance and Academia are chosen for study. The policy initiatives, frameworks and challenges in the implementation of FOSS in these two areas are discussed, while giving instances of its successful adoption. The study also discusses in brief the adoption of FOSS in business enterprise, where its adoption is dynamic and accelerated. Several challenges in adoption of FOSS over propriety software are also pointed out.

Keywords: Adoption, FOSS, Proprietary software

INTRODUCTION

The Free and Open Source Software (FOSS) movement attained prominence in the 1980s, primarily to unshackle the restrictions imposed on the use of copy righted software, now known as CSS (Closed Source Software). Today, although one may not be aware, FOSS is actually providing for the computational requirements for a large spectrum of products and services which make the modern, technologically intensive digital life possible. Most of the smart phones (android based), servers and portals, ATMs, supercomputers, databases etc around the world are FOSS driven. In India, two humongous citizen-specific projects – Aadhar's online infrastructure and the railway booking website utilizes the Linux servers. The FOSS provides a myriad of advantages over the CSS at all stages – development, distribution and research, which have been extensively mentioned in the literature [1-5]. Given the intrinsic freedom of usage, customization, propagation and the relative cost effectiveness which all products of FOSS offers, the adoption of FOSS by a country like India could have been a natural and prudent choice as the nation endevours to upscale the use of IT (information technologies) in its pursuit of digital governance. In this context, one may be betting on India becoming the global FOSS hub. It's evident to expect that the India is a fertile ground for the nurturing of a strong and mature FOSS ecosystem. A FOSS ecosystem comprises of a multitude of stakeholders – government, academic institutions like schools and colleges, FOSS solution providers and the FOSS community. Moreover, in India there is no dearth of business opportunities for providing IT solutions to enterprise. This is because India is only next to China in having the largest base of Internet users, notwithstanding the fact that 80 per cent of its population still needs to go online. When this is seen in the background of the availability in the last two decades of large number of reliable and robust FOSS products, which provides solutions for all domains, wherein the CSS have hitherto provided the services (Refer Table 1) the above expectation is certainly not misplaced.

So, where does India stand on the adoption of free software? The adoption of FOSS in India, until now can be described as patchy and sporadic, without a concerted push to adopt FOSS in the daily computational needs of various spheres viz., Governance, academia and business enterprise. However, it must be mentioned here that although the growth of FOSS in India has witnessed a faster rate than the past, the FOSS ecosystem is far from the threshold level of maturity. This has resulted into a narrow user base for FOSS in India. The government's efforts for FOSS adoption have been varied. While some efforts are subtle, voluntary and staggered, some migrations to FOSS have been hard and coercive. In most cases, migration to FOSS are justified from the perspectives of cost and security and its salient features of being participative, egalitarian and democratic is not emphasized sufficiently. While the goal of making India a global hub for FOSS is laudable, it becomes necessary to examine the extent of adoption and the associated challenges in the migration to FOSS for the computational needs of the digital society which we envisage in India. The present paper surveys the extent of adoption of FOSS in the three major areas of the Indian society i.e., Governance, academia and business enterprise. The study also attempts to identify the impediments in each of these spheres which are inhibiting the development of a supportive and mature ecosystem around FOSS which can harness FOSS to its full potential.

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Optical Materials

Volume 83, September 2018, Pages 342-347

Spherical growth of nanostructures ZnO based optical sensing and photovoltaic application

Rakesh K. Sonker [a], S. Sikarwar [b], S.R. Sabhajeet [b], Rahul [c], B.C. Yadav [b]

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https://doi.org/10.1016/j.optmat.2018.06.046

Abstract

The present paper reports deviation in the intensity of light transmitted through the film of ZnO spherical nanostructure (SNSs) with the exposure of humidity at room temperature. For this purpose, the precursor of ZnO SNSs was prepared and used for coating thin film on borosilicate substrates. The efficient dye-sensitized solar cells (DSSCs) are promisingly low-cost molecular solar cell devices. ZnO SNSs are promising materials used to use to create photoanodes for DSSCs. The film was then investigated using SEM, HR-TEM, XRD and UV–visible transmittance techniques. Further, it was employed as transmission based optical humidity sensor, the maximum sensitivity of which was found a ~ 1.81 μW/%RH with response and recovery time of 36 s and 124 s respectively. The sensor showed ~97% reproducible results. The fabricated ZnO SPSs based DSSC shows a short circuit current density (J_{sc}) of 3 mA/cm^2, open circuit voltage (V_{oc}) of 0.62 V and efficiency (η) of 1.3% at one sun condition.

Integrated Ferroelectrics >
An International Journal
Volume 194, 2018 - Issue 1: International Symposium on Integrated Functionalities (ISIF 2017), Part II

Section G: Tunable Dielectrics for RF and High Frequency Devices

Study of electrical, dielectric and EMI shielding behavior of copper metal, copper ferrite and PVDF composite

Krishna Kamal Halder, Rakesh K. Sonker, V. K. Sachdev, Monika Tomar & Vinay Gupta

Pages 80-87 | Received 10 Dec 2017, Accepted 16 Jul 2018, Published online: 16 Apr 2019

https://doi.org/10.1080/10584587.2018.1514879

Zn-Doped TiO_2 Nanoparticles Employed as Room Temperature Liquefied Petroleum Gas Sensor

Authors: Sabhajeet, S. R.; Sonker, Rakesh K.; Yadav, B. C.

Source: Advanced Science, Engineering and Medicine, Volume 10, Numbers 7-8, July 2018, pp. 736-740(5)
Publisher: American Scientific Publishers
DOI: https://doi.org/10.1166/asem.2018.2249

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Published: 05 June 2018

Synthesis and investigation of cubical shaped barium titanate and its application as opto-electronic humidity sensor

Samiksha Sikarwar, Rakesh K. Sonker, Anuj Shukla & B. C. Yadav

Journal of Materials Science: Materials in Electronics **29**, 12951–12958 (2018) | Cite this article

Abstract

In the current scenario, nanoscience and nanotechnology are playing a vital role in the upliftment of the quality of human life. The quantum confinement effect that arises at the nano-dimensional particles, changes the properties of the material in a drastic way. The present paper reports the successful synthesis of $BaTiO_3$ using rotary evaporator and fabrication of sensing elements by deposition of films on flat borosilicate glass substrates using 2-methoxy ethanol and homogeneous precursor in the ratio of 1:4, 2:4, 3:4 and 4:4. These films were then annealed at 650 °C and characterized through various techniques. Morphological investigation as obtained from SEM reported the cubical clusters and the dimensionality of these clusters, decreases with increase in the concentration of 2-methoxy ethanol. An optical investigation done through UV–Vis spectrum showed the absorbance in the UV range and Tauc plot estimated the optical band gaps of 3.842, 3.854, 3.864 and 3.872 eV for the respective films. Structural information as obtained from XRD of the film having 2-methoxy ethanol and homogeneous precursor in the ratio of 4:4 gave minimum crystallite size of ~ 18 nm. Further, these films were employed as opto-electronic humidity sensor where the maximum sensitivity of the sensing elements was found as 2.15, 2.79, 3.28 and 3.67 μW/%RH respectively. Thus as the concentration of 2-methoxy ethanol in the solution increases, the properties of the material increases and hence the humidity sensing potency also increases.

Optik
Volume 169, September 2018, Pages 166-171

Original research article

Less toxic tin incorporated perovskite solar cell using polymer electrolyte processed in the air

Rahul [a b], Pramod K. Singh [b], M. Parvaz [a], Sultan Ahmed [a], Rakesh K. Sonker [c], B. Bhattacharya [b], Zishan H. Khan [a]

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https://doi.org/10.1016/j.ijleo.2018.05.064 Get rights and content

Abstract

Perovskite sensitizer materials based solar cell (PSSC) is freshly seemed as warm topic because very soon they achieve higher efficiency (~20%) at incident light intensity 100 mw/cm^2 (1 sun condition). This paper deals the fabrication, characterization as well as application of perovskite material. Perovskite material i.e. $MASnCl_3$(CH_3NH_3SnCl3) was composed by coordinate statement of equimolar convergence of CH_3NH_3Cl and tin $SnCl_2$ in DMF arrangement. It was extra portrayed utilizing different characterization methods like X-Ray diffraction (XRD), UV–vis ingestion spectroscopy and Scanning electron microscope (SEM). PSSC has been fabricated utilizing methyl ammonium tri-tin chloride ($CH_3NH_3SnCl_3$) perovskite and polyethylene oxide (PEO) solid polymer electrolyte(SPE)sandwiched between perovskite working electrode (WE) and platinum counter electrode (CE) and its implementation at room condition has been accounted for in this paper. The fabricated PSSC demonstrates a short out current density (Jsc) of 1.8 mA/cm^2, Voc of 0.48 V, fill factor of 0.68 and efficiency (η) of 0.60% at one sun condition.

AIP Conference Proceedings

RESEARCH ARTICLE | MAY 08 2018

Sol-gel formed spherical nanostructured titania based liquefied petroleum gas sensor

S. R. Sabhajeet; B. C. Yadav; Rakesh K. Sonker

AIP Conference Proceedings 1953, 030078 (2018)
https://doi.org/10.1063/1.5032413

The present work reports the preparation of Titania(TiO_2) thin film by sol-gel technique and its Liquefied Petroleum Gas (LPG) sensing. TiO_2 exists in numerous phases possessing different structural properties like amorphous, anatase or anatase/rutile mixed phases. The structural analysis confirmed the formation of TiO_2 having an average crystallite size 21 nm. SEM showed the regular and porous surface morphology. The band gap of the material was found as 3.65 eV. This film was employed for LPG sensing and variations in resistance with exposure of LPG were observed. Sensor response (S) as a function of time was calculated and its maximum value was found as 2.8 for 4% vol. of LPG with a response and recovery times of 240 sec and 248 sec respectively.82

Materials Letters
Volume 223, 15 July 2018, Pages 133-136

ZnO nanoneedle structure based dye-sensitized solar cell utilizing solid polymer electrolyte

Rakesh K. Sonker [a], Rahul [b], S.R. Sabhajeet [c]

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https://doi.org/10.1016/j.matlet.2018.03.199 Get rights and content

Abstract

Developing new technologies that could lead to alternatives to the traditional silicon-based solar panels and to efficiently light the world in the future, is critically important because of limited natural petroleum resources. Dye-sensitized solar cells (DSSCs) are promisingly efficient and clean hybrid, organic–inorganic, low-cost molecular solar cell devices. Because of their unique, multifunctional properties, zinc oxide (ZnO) nanostructures are promising materials to use to create photoanodes for DSSCs. ZnO was one of the first metal oxides which used in dye-sensitized solar cells. It exhibits a unique combination of potentially interesting properties such as high bulk electron mobility and probably the richest variety of nanostructures based on a very wide range of synthesis routes. The fabricated ZnO nanoneedle based DSSCs shows a short circuit current density (J_{sc}) of 20 mA/cm^2, open circuit voltage (V_{oc}) of 0.48 V, fill factor (FF) of 0.44 and efficiency (η) of 4.2% at one sun condition.

ELSEVIER

Optics Communications
Volume 427, 15 November 2018, Pages 37-43

Enhancement in self-compression due to co-propagating laser pulse in plasma

Sintu Kumar, Pradeep Kumar Gupta, R. Uma, R.P. Sharma

https://doi.org/10.1016/j.optcom.2018.06.023

Abstract

The study proposes enhancement in self-compression of the laser pulse with relativistic nonlinearity in a plasma. It is presented that, a low-intensity laser pulse can tune the pulse duration and peak intensity of the high-intensity laser pulse. The coupled modified nonlinear Schrodinger equations (MNLS) have been established for both laser pulses in plasma. The enhancement in compression of the high-intensity laser pulse is solved by numerical methods. The nonlinearity of plasma, self-phase modulation (SPM), and group velocity dispersion (GVD) compress the laser pulse to the extremely short duration high peak intensity laser pulse. As a result, it is observed that the compression of the high-intensity laser pulse is highly sensitive to the combined intensity of both laser pulses, plasma density and even a small walkoff between two pulses can affect the high-intensity laser pulse compression.

Chemical Route Deposited SnO_2, SnO_2-Pt and SnO_2-Pd Thin Films for LPG Detection

Authors: Sonker, Rakesh Kumar; Yadav, B. C.
Source: Advanced Science Letters, Volume 20, Numbers 5-6, May 2014, pp. 1023-1027(5)
Publisher: American Scientific Publishers
DOI: https://doi.org/10.1166/asl.2014.5476

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Abstract | References | Citations
Supplementary Data | Suggestions

In the present work chemical route method was used to deposit different catalyst (Pt and Pd) doped

RESEARCH ARTICLE | APRIL 26 2018

Dynamics of focused femtosecond laser pulse during odisruption of crystalline lens

Kumar Gupta ; Ram Kishor Singh; R. P. Sharma

Article Information
Plasmas 25, 043121 (2018)
org/10.1063/1.5025006 Article history

Propagation of laser pulses of femtosecond time duration (focused through a focusing lens inside the crystalline lens) has been investigated in this paper. Transverse beam diffraction, group velocity dispersion, **graded refractive index** structure of the crystalline lens, self-focusing, and photodisruption in which plasma is formed due to the high intensity of laser pulses through multiphoton ionization have been taken into account. The model equations are the modified nonlinear Schrödinger equation along with a rate equation that takes care of plasma generation. A close analysis of model equations suggests that the femtosecond laser pulse duration is critical to the breakdown in the lens. Our numerical simulations reveal that the combined effect of self-focusing and multiphoton ionization provides the breakdown threshold. During the focusing of femtosecond laser pulses, additional spatial pulse splitting arises along with temporal splitting. This splitting of laser pulses arises on account of self-focusing, laser induced breakdown, and group velocity distribution, which modifies the shape of laser pulses. The importance of the present study in cavitation bubble generation to improve the elasticity of the eye lens has also been discussed in this paper.

Vector Biology Journal

ISSN: 2473-4810

Research Article, Vector Biol J Vol: 3 Issue: 1

Potential of Nardostachys jatamansi Extracts to Manage Indian Strain of Aedes aegypti: A Novel Approach for Vector Control

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Volume 3, Issue 2, pp 01-11

Gesture Recognizing Smart System

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ABSTRACT

For differently abled people like deaf or dumb, communication is a challenge. They make use of sign language which is not easily understandable by others and hence poses severe challenges and inconveniences for them in carrying out their day to day task. This work attempts to bridge the communication gap by designing a device that can convert the user's sign language gestures to visual form. The primary focus of the work is to design a portable, intelligent, smart, and cost-effective system using flex sensors and accelerometer which identifies the extensive hand movements of the differently abled person while communicating using sign language and in effect can facilitate him/her in communicating with others. The portable device can capture the user's sign language gestures, convert it to text and outputs the translated text to PC serial monitor, which can easily be understood and can also be converted to voice to be heard by the normal audience. The work also encompasses the design of mobile application for further assistance to differently abled persons.

Keywords: Arduino, Flex Sensors, Gesture Recognition, Sign Language

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Acrylonitrile copolymer based membrane sensor for selective detection of Pb^{2+} ions in aqueous medium

[1] Shyam Lal, [2*] Sunita Hooda, [3] Amit Kumar, [4] Subodh Kumar, [5] Aarushi Singh, [6] Snigdha Singh, [7*] Ramesh Chandra, [8] Vikrant Kumar, [9] Vandana Uberoi, [10] Geetu Gambhir, [11] Drashya

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Abstract

A lead (II) ion selective sensor has been facilely fabricated from Styrene - Acrylonitrile (SA) copolymer as a neutral carrier, sodium tetra phenyl borate (NaTPB) as an anionic excluder and tri butyl phosphate (TBP) as a plasticizing solvent mediator. Fabricated sensor, over a concentration range of $1x10^{-5}$-$1x10^{-1}$ mol L^{-1} revealed a best Nernstian response for Pb (II) ions with a slope of 39.60 mV/decade. Potentiometric selectivity coefficient values as determined by Fix Interference Method (FIM) and Match Potential Method (MPM) indicated that the electrode has good selectivity of Pb^{2+} ion over other heavy metal ions. The performance of proposed sensor in non aqueous mixtures up to 20 % (v/v) ethanol was satisfactory. The effect of surfactant and detergent on the working of Pb^{2+} ion selective electrode was also studied. The electrode can be used for the determination of lead ion pollution in waste water sample.

Keywords: styrene, acrylonitrile, copolymer, ion selective electrode, potentiometric sensor

Introduction

A large number of heavy metals and their compounds are found in the industrial waste and responsible for the environmental pollution. The major sources of lead wastes are lead battery effluent, paint and leather industry. World Health Organization (WHO) [1] has recognized an action level of 10 ppb (µg/L) for lead in drinking water. Therefore, reliable and convenient determination of lead (II) ion is significantly important and emergent in monitoring human health effects and the environment. Lead is a strong poison and tends to

might not be available in most analytical laboratories [11]. To monitor lead metal, membrane sensors are well-known analytical tools used for the selective and direct measurement of a wide variety of different ions in complex biological and environmental samples. Potentiometric sensors is a direct method that does not require a pretreatment of samples and has noticeable advantages including simple instrumentation, fast response, wide dynamic range, high analyte selectivity, minimal use of toxic solvents, superior detection limit,

Structure-Guided Design and Development of Potent and Selective Dual Bromodomain 4 (BRD4)/Polo-like Kinase 1 (PLK1) Inhibitors

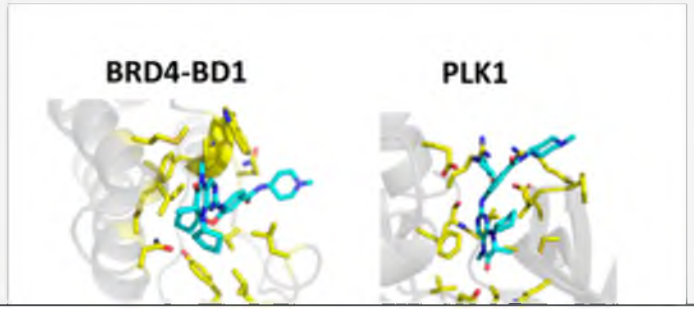
Shuai Liu, Hailemichael O. Yosief, Lingling Dai, He Huang, Gagan Dhawan, Xiaofeng Zhang, Alex M. Muthengi, Justin Roberts, Dennis L. Buckley, Jennifer A. Perry, Lei Wu, James E. Bradner*, Jun Qi*, and Wei Zhang*

Cite this: *J. Med. Chem.* 2018, 61, 17, 7785−7795
Publication Date: August 20, 2018
https://doi.org/10.1021/acs.jmedchem.8b00765

Journal of Medicinal Chemistry

Abstract

The simultaneous inhibition of polo-like kinase 1 (PLK1) and BRD4 bromodomain by a single molecule could lead to the development of an effective therapeutic strategy for a variety of diseases in which PLK1 and BRD4 are implicated. Compound **23** has been found to be a potent dual kinase–bromodomain inhibitor (BRD4-BD1 IC_{50} = 28 nM, PLK1 IC_{50} = 40 nM). Compound **6** was found to be the most selective PLK1 inhibitor over BRD4 in our series (BRD4-BD1 IC_{50} = 2579 nM, PLK1 IC_{50} = 9.9 nM). Molecular docking studies with **23** and BRD4-BD1/PLK1 as well as with **6** corroborate the biochemical assay results.



Issue 13, 2018

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From the journal:
Green Chemistry

Sequential (3 + 2) cycloaddition and (5 + *n*) annulation for modular synthesis of dihydrobenzoxazines, tetrahydrobenzoxazepines and tetrahydrobenzoxazocines†

Check for updates

Alex Muthengi,[a] Xiaofeng Zhang,[a] Gagan Dhawan,[b] Wensheng Zhang,[c] Francesca Corsini[a] and Wei Zhang *[a]

Author affiliations

Abstract

A two-step method for the (3 + 2) cycloaddition of azomethine ylides followed by a double S_N2 substitution-based (5 + *n*) annulation is introduced for the modular synthesis of dihydrobenzoxazine, tetrahydrobenzoxazepine and tetrahydrobenzoxazocine derivatives. After a quick water wash without further purification, the (3 + 2) cycloaddition intermediates were used for the (5 + *n*) annulation to afford products. Green chemistry metrics analysis of the

Published in Journal

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DOI: 10.29070/JASRAE

Authors:
Sudha Vipin Sharma*, Sunita Hooda,

Subjects:
Multidisciplinary Academic Research

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Volume: 15 / Issue: 11
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Published On: Nov, 2018

An Analysis on Recent Technological Developments in Green Chemistry: Biocatalytic Processes | *Original Article*

— Sudha Vipin Sharma*, Sunita Hooda, in *Journal of Advances and Scholarly Researches in Allied Education* | *Multidisciplinary Academic Research*

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ABSTRACT

Enzymes are the most capable catalysts, offering considerably more focused processes contrasted with chemical catalysts. The quantity of modern applications for enzymes has detonated as of late, principally inferable from advances in protein building innovation and environmental and monetary necessities. In this, we audit late advancement in protein biocatalysis, and talk about the patterns and procedures that are prompting more extensive mechanical compound applications. The difficulties and openings in creating biocatalytic processes are additionally talked about. Enzymes as mechanical biocatalysts offer various points of interest over conventional chemical processes as for supportability and process proficiency. Protein catalysis has been scaled up for business processes in the pharmaceutical, nourishment and refreshment enterprises, albeit further upgrades in dependability and biocatalyst usefulness are required for ideal biocatalytic processes in the vitality area for biofuel creation and in gaseous petrol change. The specialized hindrances related with the execution of immobilized enzymes recommend that a multidisciplinary approach is fundamental for the improvement of immobilized biocatalysts relevant in such modern scale processes. In particular, the cover of specialized aptitude in catalyst immobilization, protein and process designing will characterize the up and coming age of immobilized biocatalysts and the effective scale-up of their initiated processes. This audit talks about how biocatalysis has been effectively conveyed, how protein immobilization can enhance modern processes, and in addition centers around the investigation devices basic for the multi-scale execution of compound immobilization for expanded item yield at most extreme market gainfulness and least calculated weight on the environment and client.

KEYWORDS

SIGHTINGS OF *JAMIDES BOCHUS* (STOLL, [1782]) AND *PROSOTAS NORA* (C. FELDER, 1860) (INSECTA: LEPIDOPTERA: LYCAENIDAE) FROM URBANIZED PARTS OF NEW DELHI, INDIA

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The population of Delhi has increased seventy fold during the last century, with concurrent expansion of urban or concretized landscape (Anonymous, 1912; Anonymous, 2011). Presently, the urbanized portion of Delhi is dotted with numerous parks and gardens harbouring domesticated flora. An evident effect of urbanization of a geographical area is change in the species composition of plants and animals, and, in fact, urbanization introduces novel ecosystems (Lepczyk *et al.*, 2017; Donahue & Lambert, 2015). Insects such as butterflies, which require larval host plants for their survival and are sensitive to the effect of urbanization, can act as an indicator of biodiversity in urban settings (Clark *et al.*, 2007; Fontaine *et al.*, 2016; Dennis *et al.*,

The first partial list of butterflies of Delhi was prepared by Longstaff (1912), mentioning 21 species. An elaborate list of 62 butterflies was made by Jandu (1942, 1943) and Donahue (1967) listed 77 species of butterflies. The list was expanded to include 86 species by Larsen (2002). Recently, a checklist of 115 species of butterflies seen in Delhi was published by Biswas *et al.* (2017). The increase in the butterfly count over time, as evident from these lists, could be the effects of gradual changes in the pattern of floral diversity and habitat due to horticultural practices and urbanization. Alternatively, it may merely be the result of increased observation.

Here, we report the recent sightings of two species of butterflies, *Jamides bochus* (Dark Cerulean) and *Prosotas nora*

Article | Published: 04 May 2018

Occurrence of subdioecy and scarcity of gender-specific markers reveal an ongoing transition to dioecy in Himalayan seabuckthorn (*Hippophae rhamnoides* ssp. *turkestanica*)

Yash Mangla, Kamal Das, Sapinder Bali, Heena Ambreen, Soom Nath Raina, Rajesh Tandon ✉ & Shailendra Goel ✉

Heredity **122**, 120–132 (2019) | Cite this article

Abstract

Dioecy and the dynamics of its evolution are intensely investigated aspects of plant reproduction. Seabuckthorn (*Hippophae rhamnoides* ssp. *turkestanica*) is an alpine shrub growing wild in certain parts of western Himalaya. The previous studies have reported heteromorphic sex chromosomes in the species and yet marker-based studies indicate high

10.24425/acs.2019.129384

Archives of Control Sciences
Volume 29(LXV), 2019
No. 2, *pages* 307–322

Synchronization of fractional order Rabinovich-Fabrikant systems using sliding mode control techniques

SANJAY KUMAR, CHAMAN SINGH, SADA NAND PRASAD,
CHANDRA SHEKHAR and RAJIV AGGARWAL

In this research article, we present the concepts of fractional-order dynamical systems and synchronization methodologies of fractional order chaotic dynamical systems using slide mode control techniques. We have analysed the different phase portraits and time-series graphs of fractional order Rabinovich-Fabrikant systems. We have obtained that the lowest dimension of Rabinovich-Fabrikant system is 2.85 through utilization of the fractional calculus and computational simulation. Bifurcation diagrams and Lyapunov exponents of fractional order Rabinovich-Fabrikant system to justify the chaos in the systems. Synchronization of two identical fractional-order chaotic Rabinovich-Fabrikant systems are achieved using sliding mode control methodology.

Key words: fractional-order chaotic system, chaos synchronization, Rabinovich-Fabrikant system, Lyapunov exponents

1. Introduction

Chaos, an inevitable phenomenon is the part of nonlinear systems. It is highly sensitive to the initial conditions. This sensitivity is popularly known as the butterfly effect [1]. Since Pecora and Carroll established the concept of chaos synchronization with different initial conditions, it (chaos synchronization) has been received much attention in the field of research. Synchronization of two or more than two chaotic dynamical systems is one of most important applications of chaos. Last several decades, chaos synchronization has been become the research

An Optimal Policy for Deterministic Model for Time Proportional Deteriorated Inventory with Different Demand Rate Pattern

Sachin Kumar Verma, Research Scholar, Department of Mathematics and Statistics, Manipal University, Jaipur, Rajasthan, India. Email: manipal.kumar.sachin1985@gmail.com

Mohd. Rizwanullah, Associate Professor, Department of Mathematics and Statistics, Manipal University, Jaipur, Rajasthan, India.

Chaman Singh, Assistant Professor, Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, Delhi, India.

Abstract--- In this paper, we have formulated an economic order quantity inventory model for a deteriorating item having a twofold deterministic demand rate. The Constant demand rate in the first part of the cycle and the exponential demand rate in the second part of the cycle has been taken. We also considered deterioration rate is time sensitive in nature and Shortages are not the part of this model. A complete solution procedure is provided to demonstrate the proposed model. Also, a numerical example and sensitivity analysis of various unknown parameters illustrated in this model.

Keywords---Constant and Time Dependent Exponential Demand Rate, Deteriorating Items, EOQ, Time Proportional Deterioration Rate.

I. Introduction

In today's competitive world, Mostly business organizations trying to stress on inventory management and their problems, which occurred frequently. It is known that every business organization showing their interest to obtain economic order quantity (EOQ), through which minimized total average inventory cost can be achieved. During the last couple of decades, it has been observed that, many researches working in the direction to control and maintain the inventory in the better and efficient way. In real practical life situation, decay or deterioration of normal talk in now days. Vegetables, fruits, foods are some example of some items having deterioration in nature. As the time increases, deteriorating items keep losing their original value with regard the quantities and qualitative aspect. Therefore, Ignorance of deteriorating factors while analyzing the model leads to harmful results. So it is an unavoidable factor, which should be given attention during the optimization inventory problems Sharma, A. et.al [24] [25] suggested the inventory model in which different demand rate has been taken with a different time interval. Commercial based lot size model for price sensitive dependent demand.

World View | Published: 20 May 2019

Influence of open educational resources on educational practices in the Global South

Sarita Kumar

Nature Human Behaviour **3**, 540–541 (2019) | Cite this article

Open educational resources enable the effective use and sharing of knowledge with those who have been denied an education due to economic or social circumstances. Sarita Kumar outlines how open educational resources can benefit education systems across the Global South by opening up an entire generation to new ideas, technologies and advancements.

22 April 2019

Diminished Activity of Larval Midgut Transaminases and Phosphatases in *Helicoverpa armigera* Hübner (Lepidoptera) Induced by Dietary Stem Extracts of *Thevetia neriifolia*

Monika Mishra, *Kamal Kumar Gupta*, *Sarita Kumar*

Author Affiliations

The J. of the Lepidopterists' Society, 73(1):23-33 (2019). https://doi.org/10.18473/lepi.73i1.a4

Abstract

Helicoverpa armigera Hübner (Noctuidae) is a common crop pest causing extensive loss of crop yields despite several efforts and diverse measures taken. As utilization of synthetic pesticides in the fields have caused ecological disturbances and lethal effects on humans and organisms; present studies explore *Thevetia neriifolia* (Apocynaceae), a widely used ornamental plant, against *H. armigera* as an alternate control measure. The study investigates the dietary effects of hexane and methanol extracts of *T. neriifolia*

Original Article | Published: 04 July 2019

Draft genome of *Streptomyces* sp. strain 130 and functional analysis of extracellular enzyme producing genes

Munendra Kumar, Prateek Kumar, Payal Das & Monisha Khanna Kapur

Molecular Biology Reports **46**, 5063–5071 (2019) | Cite this article

518 Accesses | **8** Citations | **1** Altmetric | Metrics

Abstract

Streptomyces sp. strain 130 possesses multiple uncharacterized extracellular enzyme producing genes. Enzymes from these genes may fulfil the intense demand of stable and effective extracellular enzymes in various industries. Taxonomy of *Streptomyces* sp. strain 130 was validated by FAME analysis. Strain 130 was screened for the presence of chitinase producing genes of family 18 and 19 using SC1F/SC2R and F19F2/F19R primer sets respectively. Whole genome sequencing was done using Illumina Next Seq 500 system. In the analysis of draft genome of *Streptomyces* sp. strain 130, the genome size was found to be 7.1 Mb. Blastn and NCBI-conserved domain search tool were used to find similarity percentage with genes in existing database and enzyme family respectively. Ten chitinase, six xylanase and one cellulase producing genes were present in draft genome. Among the ten chitinase

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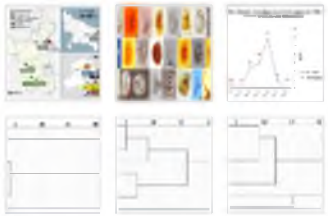

Tables (6)

Saudi Journal of Biological Sciences
Volume 26, Issue 6, September 2019, Pages 1305-1313

Original article

Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as sensitive bio-indicators for soil quality

Jeeva Susan Abraham [a], S. Sripoorna [a], Jyoti Dagar [a], Shiv Jangra [a], Anit Kumar [a], Khushi Yadav [a], Simran Singh [a], Anusha Goyal [a], Swati Maurya [a], Geetu Gambhir [a], Ravi Toteja [a], Renu Gupta [b], Dileep K. Singh [c], Hamed A. El-Serehy [d e], Fahad A. Al-Misned [d], Saleh A. Al-Farraj [d], Khaled A. Al-Rasheid [d], Saleh A. Maodaa [d], Seema Makhija [a]

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Abstract

The present investigation aims to study the diversity of ciliates from different habitats in and around Delhi, India, and the correlation of this diversity with soil quality (agricultural lands (site 1 and 2), dump yards (site 3 and 4), sewage treatment plant (site 5), residential land (site 6), landfill (site 7) and barren land (site 8)). Various physicochemical parameters of the different soil samples were studied and analysed for soil texture, interstitial water, pH, conductivity, total organic carbon, total organic matter, total nitrogen and phosphorous content, using standard protocols. Seventeen ciliate taxa belonging to four classes, seven orders, ten families, and 17 genera were recorded, with the maximum number of species (eleven) belonging to the class Spirotrichea. Ciliate diversity was highest at sites 5 and 6 and lowest at sites 1 and 2. *Spathidium* sp. was the dominant species in the conditioned land (site 8), while the ciliate *Colpoda* sp. was

INTERNATIONAL JOURNAL OF
SYSTEMATIC AND EVOLUTIONARY MICROBIOLOGY
Volume 69, Issue 4

Review Article | Free

Techniques and tools for species identification in ciliates: a review

Jeeva Susan Abraham[1], S. Sripoorna[1], Swati Maurya[1], Seema Makhija[1], Renu Gupta[2], Ravi Toteja[1]

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Published: 16 January 2019 | https://doi.org/10.1099/ijsem.0.003176

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Reviews

Ferroelectric liquid crystal nanocomposites: recent development and future perspective

Satya Prakash Yadav, Kanchan Yadav, Jayeeta Lahiri & Avanish Singh Parmar

Pages 143-169 | Received 28 Oct 2018, Accepted 27 Feb 2019, Published online: 22 Mar 2019

Download citation https://doi.org/10.1080/21680396.2019.1589400 Check for updates

ABSTRACT

Formulae display: MathJax

In recent years, dispersion of nanomaterials in liquid crystal media has attracted a great deal of attention for their applications in various fields and basic understanding. In this regard, nanocomposites of ferroelectric liquid crystals hold a great promise for technological advancement in displays, sensors, development of hybrid materials for optical applications and others. With the emphasis on the properties of ferroelectric liquid crystals, this paper presents a summarizing overview with critical comments on the progress made in last one decade in understanding the influence of nanoparticles on the ferroelectric liquid crystals. The dispersion of nanoparticles in liquid crystal (host material) significantly influences its properties, thereby making the dispersed material more promising for potential applications.

KEYWORDS: Liquid crystals | ferroelectric liquid crystals | nanocomposites | memory effect

Previous article | View issue table of contents | Next article

1. Introduction

Over the last few years, much interest has been shown to the study of ferroelectric liquid crystals (FLCs) dispersed with nanomaterials (nanoparticles (NPs), nanorods (NRs), quantum dots (QDs), etc.) of various shapes and sizes because these nanocomposites hold a great promise for the scientific advancement and technological breakthroughs in the applications of LC-based devices [1–18]. The FLCs based devices have been found to be more advantageous over the nematic liquid crystals (NLCs) based devices in terms of

Materials Research Express

PAPER

A novel method of electrochemically growing ZnO nanorods on graphene oxide as substrate for gas sensing applications

Chetna [1], Shani Kumar[1,2], A Garg[2], A Chowdhuri[3], A Jain[4] and A Kapoor[1]

Published 17 April 2019 • © 2019 IOP Publishing Ltd

Materials Research Express, Volume 6, Number 7

Citation Chetna *et al* 2019 *Mater. Res. Express* **6** 075039

DOI 10.1088/2053-1591/ab16f8

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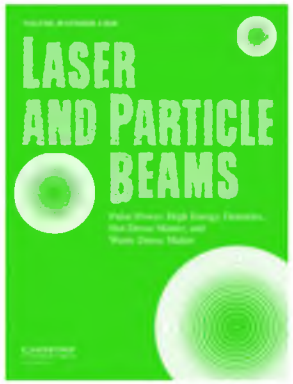
Abstract

The potential of electrochemically deposited ZnO nanorods using graphene oxide (GO) coated inter digital electrode (IDE) as substrate material for gas sensing applications has been reported. For this purpose, GO solution was synthesized via Hummer's method and coated over IDE of aluminium fabricated on the glass plate. Later ZnO nanorods were deposited on it using electrochemical method. For the structural, morphological and elemental analysis, as-grown nanorods were characterized by



Laser and Particle Beams

Transient setting of relativistic ponderomotive non-linearity and filamentation of ultra-short laser pulses in collisionless plasmas

Published online by Cambridge University Press: **11 July 2019**

R.P. Sharma, Narender Kumar, R. Uma, Ram Kishor Singh and P.K. Gupta

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Abstract

We study the setting up of relativistic ponderomotive non-linearity in an under-dense collisionless cold plasma. Using the fluid model, coupled system of equations of the laser beam and electron plasma oscillations has been derived. We present the numerical simulation for this coupled system of equations, when the coupling arises through relativistic ponderomotive non-linearity. The filamentation of the laser beam has been found to vary appreciably with

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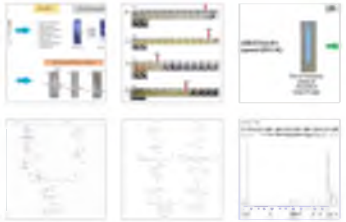

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Tables (2)

Table 1
Table 2

Microbiological Research
Volume 229, December 2019, 126312

Exploitation of potential bioactive compounds from two soil derived actinomycetes, *Streptomyces* sp. strain 196 and RI.24

Prateek Kumar [a], Aditi Kundu [b], Munendra Kumar [a], Renu Solanki [c], Monisha Khanna Kapur [a]

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Abstract

Due to emergence of drug resistant pathogens, nearly all available medicines are becoming ineffective against these life threatening pathogens so there is dire need for the discovery of compounds having unique modes of action. During our previous studies, actinomycetes designated as 196 and RI.24 were isolated, screened for bioactive compounds production and characterized using 16S rRNA gene sequencing. Colony 196 was identified as strain of *Streptomyces albolongus* (100% sequence similarity) and RI.24 as strain of *Streptomyces enissocaesilis* (100% sequence similarity). In current study, potential bioactive compounds produced by these strains were characterized. Cold extraction method was applied for taking out of bioactive compounds from actinomycetes. Minimum inhibitory concentration (MIC) determination of compounds from these strains showed activity nearly in the range of commercial antibiotics (strain 196 0.0075 mg/ml, RI.24 0.25 mg/ml and chloramphenicol 0.0075 mg/ml, ampicillin 0.025 mg/ml). Structural elucidation of these compounds was carried out using spectroscopic techniques of LC–MS/MS and ^{1}H NMR. Compounds K-252-*C*-Aglycone, indolocarbazole alkaloid, decoyinine, cycloheximide were detected from strain 196

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Original Article | Published: 04 July 2019

Expression and molecular characterization of stress-responsive genes (*hsp70* and *Mn-sod*) and evaluation of antioxidant enzymes (CAT and GPx) in heavy metal exposed freshwater ciliate, *Tetmemena* sp.

Sripoorna Somasundaram, Jeeva Susan Abraham, Swati Maurya, Ravi Toteja, Renu Gupta & Seema Makhija

Molecular Biology Reports **46**, 4921–4931 (2019) | Cite this article

812 Accesses | **15** Citations | Metrics

Abstract

Response of heavy metals namely cadmium (Cd) and copper (Cu) on the expression of stress responsive genes in the fresh water ciliate, *Tetmemena* sp. (single cell eukaryote) was studied. Stress responsive genes include heat shock protein genes and genes involved in antioxidant defence system. Quantitative real time PCR (qRT-PCR) was employed to evaluate the effects of Cd and Cu on the expression of cytosolic *hsp70* and *Mn-sod* genes. Increase in the expression of these genes was observed after exposure with the heavy metals. The macronuclear cytosolic *hsp70* and *Mn-sod* (*SOD2*) genes were also sequenced and characterized using various bioinformatics tools. In antioxidant defence system, the superoxide dismutase (SOD) family is a first line antioxidant enzyme group involved in catalysing reactive oxygen species (ROS) to hydrogen peroxide and molecular oxygen. Influence of Cd and Cu on the activity of SOD has already been reported by our group. Therefore, the enzymatic activities of antioxidant enzymes, catalase (CAT) and glutathione peroxidase (GPx) were studied in the presence of Cd and Cu and there was significant increase in activity of these enzymes in concentration dependent manner. This study suggests that cytosolic *hsp70*, *Mn-sod* and the antioxidant enzymes such as CAT and GPx can be used as effective molecular biomarkers for heavy metal

Journal of Eukaryotic Microbiology — Published by the International Society of Protistologists

Volume 67, Issue 2
March/April 2020
Pages 296-299

Symposium Article | Full Access

Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018

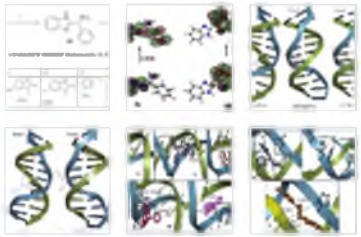
Komal Kamra, Harpreet Kaur, Shashi, Jeeva Susan Abraham, Sripoorna Somasundaram, Seema Makhija, Ravi Toteja, Alan Warren, Renu Gupta

First published: 05 November 2019 | https://doi.org/10.1111/jeu.12773 | Citations: 1

Abstract

Ciliated protists have attracted wide interest among researchers from the Indian subcontinent in the last few years. An International Symposium on Ciliate Biology (ISCB) 2018 was held on 04–06 April 2018 at the India Habitat Centre, New Delhi, India. The symposium represented a synergy with International Research Coordination Network for Biodiversity of Ciliates (IRCN-BC), an affiliate society of International Society of Protistologists (ISOP). The symposium provided a platform for Indian and International delegates to exchange knowledge, present their latest research findings, and establish collaborations as well as creating a networking opportunity for undergraduate and postgraduate students. Nine foreign delegates from 5 countries and 300 Indian delegates actively participated in the event which included 22 oral and 57 poster presentations.

RESEARCH on ciliated protists has ramified in the Indian subcontinent in last few years. The first International Symposium on Ciliate Biology held at Sri Guru Tegh Bahadur Khalsa College, University of Delhi, on 06–07 February 2007 was a successful event (Lynn 2007). The second International Symposium on Ciliate Biology (ISCB) 2018 was held on 04–06 April 2018 at the India Habitat Centre, New Delhi, India. The symposium resulted from a synergy with the International Research Coordination Network for Biodiversity of Ciliates (IRCN-BC), an



Heliyon

CellPress

Volume 5, Issue 10, October 2019, e02596

Research Article

Synthesis, DFT studies, molecular docking, antimicrobial screening and UV fluorescence studies on ct-DNA for novel Schiff bases of 2-(1-aminobenzyl) benzimidazole

Sugandha Singhal [a], Pankaj Khanna [b], Leena Khanna [a]

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https://doi.org/10.1016/j.heliyon.2019.e02596

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Abstract

Novel Schiff bases (SBs) were synthesized by condensation of 2-(1-Amino benzyl) benzimidazole with heterocyclic and aromatic carbonyl compounds. The structural characterization was done using ^{1}H, ^{13}C NMR, FTIR and ES-MS spectroscopic techniques. The *in silico* pharmacokinetics showed that nearly all compounds obeyed Lipinski rule of 5 with low toxicity and metabolic stability. The global reactivity descriptors were calculated using DFT approach. The molecular docking result of SBs with ct-DNA suggested interaction *via* groove binding mode. The antibacterial activity was tested against *S.aureus* and *E.coli*, indicated significant inhibition than reference drug. The compound **4d** gave best results at 50 μg ml^{-1} concentrations. UV/Vis and Fluorescence spectroscopy tools were used to evaluate ct-DNA binding ability of compounds **4a–e** through hypochromic shift. The steady state fluorescence predicted a moderate binding constant of 1.12×10^{4} for **4d**, indicative of non-intercalative mode.

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JOURNAL OF HETEROCYCLIC CHEMISTRY

Volume 56, Issue 10
October 2019
Pages 2702-2729

REVIEW

Recent Trends in the Synthesis of Benzimidazoles From *o*-Phenylenediamine *via* Nanoparticles and Green Strategies Using Transition Metal Catalysts

Sugandha Singhal, Pankaj Khanna, Siva S. Panda, Leena Khanna

First published: 27 October 2019 | https://doi.org/10.1002/jhet.3649 | Citations: 10

Abstract

Benzimidazole is a heterocyclic moiety of immense importance as it acts as a primary "biolinker" in diverse synthetic routes to obtain bioactive compounds. Substituted benzimidazoles are known to possess a varied range of pharmacological applications, namely, anti-cancer, anti-diabetic, anti-inflammatory, and antiviral like anti-HIV and anti-fungal. A number of reviews covering the important aspects of benzimidazoles such as pharmacological activities, SAR studies, and well-known methods of synthesis have appeared in the literature. However, green synthetic methods particularly using transition metal (TM) catalysts and their nanoparticles, although being more viable and extensively applied by researchers in the present scenario, have not been exclusively and expansively reviewed. Besides this, the vital precursors required for knitting the skeleton of benzimidazole are mainly *o*-aryldiamines. The conventional synthesis generally involved the condensation of these diamines with carbonyl/carboxylic acid derivatives either *via* high temperature heating or *via* adding strong acids, mostly resulting in poor yields or mixtures. However, recent trends are replacing these conditions by mild and green conditions through TM catalysts. Therefore, the current review emphasizes on the recent trends adopted in the synthesis of benzimidazoles using condensation reaction of *o*-phenylenediamines and various aldehydes/ester/amide/alcohols with TM in a catalytic role in nanoform and under environmentally benign green conditions.

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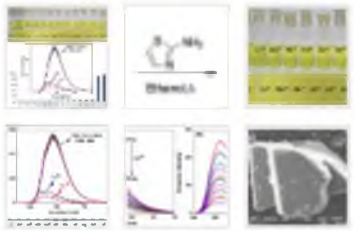

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Extras (1)

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Journal of Molecular Structure
Volume 1211, 5 July 2020, 128091

Curcumin based supramolecular ensemble for optical detection of Cu^{2+} and Hg^{2+} ions

Shyam Lal [a], Kunal Prakash [b], Nainy Khera [a], Drashya [a], Snigdha Singh [c], Aarushi Singh [c], Sunita Hooda [a], Ramesh Chandra [c]

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Highlights

- Curcumin based fluorescent probe **L1** has selective ability towards Hg^{2+} and Cu^{2+} ion in aqueous solution.
- "Real eye" evaluation of Hg^{2+} and Cu^{2+} ions was observed through paper strips.
- Supramolecular ensembing of Hg^{2+} and Cu^{2+} was confirmed through SEM, PXRD and TD-DFT methods.
- **L1** acts as smart, rapid, efficient and reusable optical probe for Hg^{2+} and Cu^{2+} ions.

Abstract

A novel curcumin based molecular probe **L1** was synthesized using 2-aminothiazole through covalent linkage. The structure of the probe **L1** was characterized by UV–Vis, Fluorescence, SEM, PXRD and other related spectroscopic techniques. The molecular

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Journal of Biomolecular Structure and Dynamics ›
Volume 38, 2020 - Issue 9

Research Articles

Repurposing of FDA-approved drugs to target MurB and MurE enzymes in *Mycobacterium tuberculosis*

Jyoti Rani, Yumnam Silla, Kasmika Borah, Srinivasan Ramachandran & Urmi Bajpai

Pages 2521-2532 | Received 03 Apr 2019, Accepted 17 Jun 2019, Accepted author version posted online: 27 Jun 2019, Published online: 11 Jul 2019

Download citation | https://doi.org/10.1080/07391102.2019.1637280 | Check for updates

Abstract

Tuberculosis (TB), caused by *Mycobacterium tuberculosis* (Mtb) is one amongst the top 10 causes of death worldwide. The growing rise in antibiotic resistance compounded with slow and expensive drug discovery has further aggravated the situation. 'Drug repurposing' is a promising approach where known drugs are examined for a new indication. In the present study, we have attempted to identify drugs that could target MurB and MurE enzymes involved in the muramic acid synthesis pathway (Mur Pathway) in Mtb. FDA-approved drugs from two repositories i.e. Drug Bank (1932 drugs) and e-LEA3D (1852 drugs) were screened against these proteins. Several criteria were applied to study the protein-drug interactions and the consensus drugs were further studied by molecular dynamics (MD) simulation. Our study found Sulfadoxine (−7.3 kcal/mol) and Pyrimethamine (−7.8 kcal/mol) to show stable interaction with MurB while Lifitegrast (−10.5 kcal/mol) and Sildenafil (−9.1 kcal/mol) showed most reliable interaction with MurE. Furthermore, binding free energy (ΔG_{bind}), RMSD and RMSF data and the number of hydrogen bonds corroborated the stability of interactions and hence these drugs for repurposing should be explored

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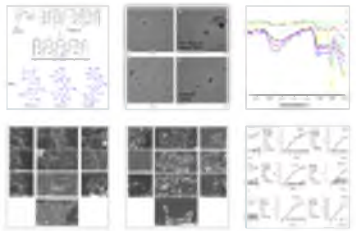

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ELSEVIER

Materials Science and Engineering: C
Volume 107, February 2020, 110284

Polydopamine –aminoglycoside nanoconjugates: Synthesis, characterization, antimicrobial evaluation and cytocompatibility

Indu Singh [a c 1], Ayushi Priyam [b 1], Diksha Jha [a], Gagan Dhawan [c], Hemant K. Gautam [a], P. Kumar [b]

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Highlights

- Polydopamine nanoparticles have been synthesized by oxidative self-polymerization.
- Aminoglycoside-conjugation yielded nanoconjugates.
- These exhibited excellent antimicrobial activity with high cyto-compatibility.
- Nanoconjugates also showed activity against resistant pathogens.

Abstract

Development of nanoparticle- and self-assembled nanomaterial-based therapeutics has become a rapidly growing area in the field of nanotechnology. One of the natural compounds, dopamine, presents as a neurotransmitter in the human brain serving as a messenger and deals with the behavioural responses, has provided an ideal platform

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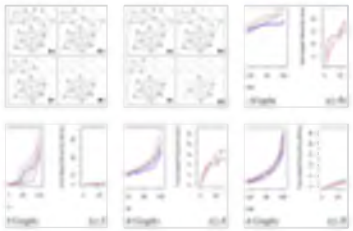

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Tables (10)

Table 1
Table 2
Table 3

Physica A: Statistical Mechanics and its Applications
Volume 536, 15 December 2019, 121029

Identifying similar networks using structural hierarchy

Rakhi Saxena [a], Sharanjit Kaur [b], Vasudha Bhatnagar [c]

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Abstract

Comparing structural similarities among complex networks is an important task in several scientific and social science applications. Existing techniques for quantifying network similarity range from network-centric methods that consider *global* network topology to node-centric methods that consider *local* node-level sub-structures.

In this paper, we address the research gap between computationally expensive network-centric approaches and myopic node-centric network comparison methods by introducing a novel approach to quantify network similarity based on hierarchical graph decomposition. The approach adequately captures both global and local topology and is motivated by the observation that networks from diverse domains such as physical, chemical, biological and social systems exhibit an inherent structural hierarchy that emerges from local dyadic and triadic interactions. The proposed algorithm, *N*etwork *S*imilarity via graph *D*ecomposition (*NSD*), extracts network signatures from hierarchical decomposition of networks and uses Canberra distance to quantify the similarity between signatures. We use two well-known graph decomposition methods to expose network hierarchy resulting in two variations of NSD. We find that our approach groups similar networks better than competing algorithms. Experimentation using 40 real-world networks, 15 massive networks, and 30 large synthetic networks establishes that the proposed methodology is effective, scalable, sensitive and applicable to wide variety of networks.

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The Impact Of Various Digitized Social Networking Media Through Text, Images And Videos On Language Usage

Sampurnananda Mishra, Chandra Kanta Samal, Navneet Yadav, Rama Kanta Choudhury

Abstract: The catalytic effect of social media on the diurnal course of people of the world has ushered in a new era of globalization. With the teeming multitudes of social media sites offering a universal user-friendly application in multifarious platforms has turned out to be a hunting ground for scholars and researchers from diverse fields. More so, their impact has been conspicuous among the language expounders and educators of today. The world has gone digital with the help of incredible tools of social media where people carry out global business and qualitative services. All the transactions , negotiations and deliberations happen through language conversation as a result of which language teaching and learning have become an indispensible part of social media. The language trainers introduce and execute various tools of social media which devises unique and novel ways of interaction transcending the local boundaries of the school. The notable social networking sites like Facebook, WhatsApp, Aadmodo Linkden, Me too etc equip educators to enhance their instructional skills. These widespread social networking sites offer a plentitude of openings for language educators to sharpen their digital, multi-literacy, linguistic and empirical skills. This paper probes into the theoretical bedrock of social networking in language learning and its effectiveness inside the classroom vis-a-vis the present pedagogy followed by different communities of the world. Further it intends to illuminate the fundamental issues and considerations while using social networking sites in a language classroom.

Keywords: Psycholinguistic approaches, Teeming multitudes, Multifarious platforms, Social networking , World wide web, IOT, Neural network.

1. INTRODUCTION

Information technology is playing a pivotal role in the use of technology in teaching and learning. Social networking has become the prime medium through which creation and transmission of information takes place. Social networking is in a state of flux and constant evolution. In order to facilitate learning and its quality, it has introduced and integrated new technologies like machine learning neural lays and neural network and IOT (Internent of things) to create a universal appeal among the world population irrespective of diversity of language and culture. There are a plethora of organized and unorganized tools which work together to enhance the quality of education. These tools facilitate, provide, engage and aid the process of teaching - learning. Social media can be compartmentalized into seven interconnected categories. (1) social networks (e.g., Facebook, LinkedIn); (2) bookmarking sites (e.g., Delicious, StumbleUpon); (3) social news (e.g., Digg, Reddit); (4) media sharing (e.g.,

1.1 Approaches to Social Networks

Theories on latest technology refer to the development and exploration of tools aimed at examining the plausible advantages in the field they are to be used. The studies are often received with a pinch of salt as they lack proper theoretical and practical framework. But it is an undeniable fact that they initiate the educators to the L2 contexts. These studies also suggest that the new tools would bring about a revolution in the traditional mind set of the existing classrooms. As far as social networking is concerned these tools are employed for learning a language and other social purposes. Studies by Stevenson and Liu, Blyth, prove to be utilitarian for the educators of language and open up avenues for further research.

1.2 Psycholinguistic Approaches

Psycholinguistic approaches to language learning aims at the significance of social interaction and getting noticed. There is a

PHYSICS OF SEMICONDUCTOR DEVICES | Published: 16 December 2019

Analysis of $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ DH-HEMT for RF and Microwave Frequency Applications

Nisha Chugh, Manoj Kumar, Monika Bhattacharya & R. S. Gupta

Semiconductors **53**, 1784–1791 (2019) | Cite this article

Abstract

A charge control based analytical model is followed to study the impact of donor-layer doping and gate-length on microwave frequency performance of AlGaN/GaN/AlGaN double heterostructure high electron mobility transistor (DH-HEMT). DH-HEMT is observed to be more sensitive to gate-length and doping variation as compared to single heterostructure high electron mobility transistor (SH-HEMT). The effect of gate-length and doping on various performance parameters, i.e., transconductance, drain conductance, cut-off frequency and maximum oscillation frequency has been analysed. The results so obtained are compared with simulation results and are found to be in good agreement.

PERTURBED SIX-BODY CONFIGURATION WITH VARIABLE MASS

ABDULLAH A. ANSARI[1], K. R. MEENA[2], SADA NAND PRASAD[2]

[1] *International Center for Advanced Interdisciplinary Research (ICAIR), Sangam Vihar, New Delhi, India,Email: icairndin@gmail.com*
[2] *Department of Mathematics, Acharya Narendra Dev College, University of Delhi, New Delhi, India*

Abstract. Six-body configuration is investigated with the effects of oblateness, variable mass as well as Coriolis and centrifugal forces, where four equal bodies are placed at the vertices of a square and fifth body is placed at the center of the circle on which the previous four bodies are moving. All five bodies are considered as oblate in shapes where first four bodies have same oblateness while fifth body has different oblateness. There is the sixth smallest body which varies its mass according to Jeans law. The system is also affected with small perturbations in the Coriolis and centrifugal forces. By considering these effects and using the Jeans law as well as Meshcherskii space time transformations, the system of equations of motion for the smallest body is determined. The Jacobian integral and mean motion are also admitted from this system. Further the equilibrium points, motion for forbidden regions and attracting regions are illustrated under the effects of above said parameters. Here twelve equilibrium points are exists out of which four equilibrium points are collinear, four points are on the perpendicular axis and rest four points are in four quadrants separately. Finally, the stability of these equilibrium points are examined by using Meshcherskii space time inverse transformations and found them unstable.

Key words: Perturbed six-body configuration – Coriolis and centrifugal forces – Oblateness – Attracting regions.

Technical Paper | Published: 28 January 2019

Sheet carrier concentration and current–voltage analysis of $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ double heterostructure hemt incorporating the effect of traps

Nisha Chugh, Manoj Kumar, Monika Bhattacharya & R. S. Gupta

Microsystem Technologies **28**, 665–674 (2022) | Cite this article

Abstract

An analytical approach incorporating traps (donor type) in the AlGaN layer at the top and bottom heterointerface is proposed to determine threshold voltage (V_{th}), net sheet carrier concentration (n_s) and drain current in $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ double-heterostructure (DH) high electron mobility transistor (HEMT). Generation of carriers in the 2DEG due to detrapping of these donor traps have been thoroughly studied in the present analysis. Due to traps in the upper and lower AlGaN layer, two 2DEG channels formed, such that n_s in a DH-HEMT is nearly twice as compared to that obtained in single heterostructure (SH). Due to increased 2DEG density, drain current is more in DH-HEMT as compared to SH-HEMT. The effect of incorporation of these donor traps on V_{th}, n_s and drain current of DH-HEMT as compared to SH-HEMT has been studied. The effect of Al mole fraction, AlGaN layer thickness, mobility, trap concentration and temperature on drain current of DH-HEMT as compared to SH-HEMT has also been studied. The analysis has been performed

J Matern Fetal Neonatal Med. 2019 Nov;32(21):3511-3519. doi: 10.1080/14767058.2018.1465914. Epub 2018 May 2.

Cytokine-induced expression of nitric oxide synthases in *Chlamydia trachomatis*-infected spontaneous aborters

Priya Prasad [1], Namita Singh [1], Banashree Das [2], Sheikh Raisuddin [3], Mridu Dudeja [4], Sangita Rastogi [1]

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PMID: 29720007 DOI: 10.1080/14767058.2018.1465914

Abstract

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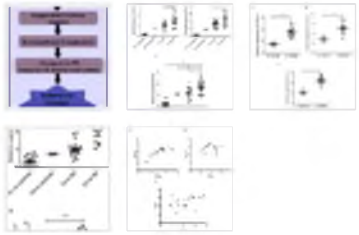

Tables (4)

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Microbial Pathogenesis
Volume 142, May 2020, 103994

Does tumour necrosis factor alpha-induced cyclooxygenase-2 expression lead to spontaneous abortion in *Chlamydia trachomatis*-infected women

Namita Singh [a], Priya Prasad [a], Banashree Das [b], Sangita Rastogi [a]

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https://doi.org/10.1016/j.micpath.2020.103994

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Highlights

- Study revealed effect of proinflammatory cytokines on *C. trachomatis*-positive SA.
- Increased expression of TNF-α, IFN-γ, IL-8 in ECT of *C. trachomatis*-positive SA.
- TNF-α, IFN-γ and IL-8 expression was significantly higher in RSA *versus* SSA.
- TNF-α and COX-2 were positively correlated with each other in infected aborters.
- Aberration in TNF-α and IFN-γ can induce COX-2 leading to immunopathogenesis of SA.

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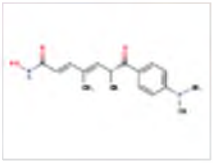

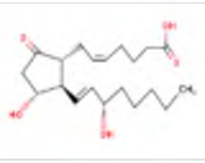

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Sharifun Shahnaj [1], Rimpy Kaur Chowhan [2], Potshangbam Angamba Meetei [3], Pushpa Kakchingtabam [4], Khundrakpam Herojit Singh [5], Laishram Rajendrakumar Singh [6], Potshangbam Nongdam [7], Aron B Fisher [8], Hamidur Rahaman [9]

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PMID: 30717364 PMCID: PMC6406459 DOI: 10.3390/antiox8020033

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Abstract

Peroxiredoxins(Prdx), the family of non-selenium glutathione peroxidases, are important antioxidant

Biochim Biophys Acta Gene Regul Mech. 2020 Mar;1863(3):194479.
doi: 10.1016/j.bbagrm.2019.194479. Epub 2020 Jan 10.

Prion protein transcription is auto-regulated through dynamic interactions with G-quadruplex motifs in its own promoter

Prashant Pradhan [1], Ankit Srivastava [1], Jasdeep Singh [1], Banhi Biswas [1], Akanksha Saini [1], Ibrar Siddique [2], Pooja Kumari [3], Mohd Asim Khan [4], Akhilesh Mishra [1], Pramod Kumar Yadav [1], Shivani Kumar [1], Neel Sarovar Bhavesh [3], Prasanna Venkatraman [5], Perumal Vivekanandan [6], Bishwajit Kundu [7]

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PMID: 31931179 DOI: 10.1016/j.bbagrm.2019.194479

Abstract

Original Article | Published: 05 March 2019

A study of software reliability on big data open source software

Ranjan Kumar, Subhash Kumar & Sanjay K. Tiwari

International Journal of System Assurance Engineering and Management **10**, 242–250 (2019) | Cite this article

Abstract

With the increasing use of Open Source Software (OSS) in high speed networking, parallel processing and distributed computing, OSS has emerged as mainstream in the last decade and is now being broadly accepted even by the traditional proprietary software development companies. The major advantages of OSS over traditional software development are less development cost, availability of source code, quality and security. Software reliability—an important attribute of software quality, is defined as the probability that a software will operate free of failures or breakdown for a specified time under specified conditions (IEEE Std. 1633-2016). Investigation of Software reliability with the help of software reliability

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 9 (2019) pp. 2260-2269

A Case Study on R: a powerful OSS and data analysis platform

Ranjan Kumar[1], Subhash Kumar[2], Sanjay K. Tiwary[3]

Abstract

R, an open source software, has emerged as a powerful tool for statistical computing and data visualization. It is also the favoured programming language for data science in the last decade. Its open source platform has allowed a tremendous growth in its community which has contributed R packages independently. Number of R packages has grown exponentially in the last five years. This paper undertakes a case study of R wherein the popularity of R and its development paradigm is explored, while studying salient features of its organization structure. Statistical inferences are drawn with respect to organization structure by performing statistical analysis of the available data on commits in R. The bug management system - a very important attribute of software quality is probed further while carrying out statistical analysis of the bug data of R. This supports the rigorous protocol of bug management system for OSS in general and R in particular.

Keywords: Commits, Bug management system, Data science, Software quality, Visualisation

1. INTRODUCTION

In recent times effective modeling, statistics, predictive analysis, data visualizations and powerful analytics is being harnessed by data scientists and leaders in making decisions and policies in a multitude of fields ranging from broad societal mapping, online marketing trends to the development of

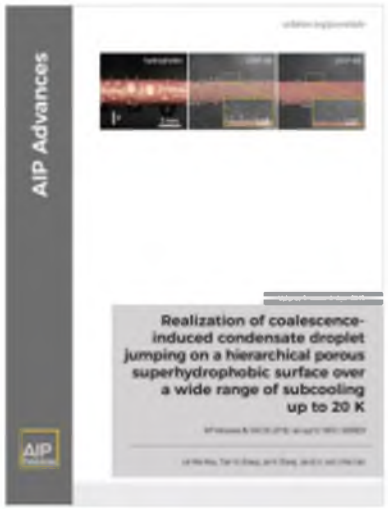
Gentleman released this software as free open-source software in 1995 [2]. Presently, the "Comprehensive R Archive Network" (CRAN) is the core of an increasingly growing R community [3] and it serves as the central repository for all resource materials related to R, including packages of functions, tutorials and discussion forums. The official public structure for the R Community is under the aegis of the R Foundation - a not for profit organization with a prestigious list of members and supporters. R is registered under GNU (General Public License). R is a programming language used by statisticians, data scientist and anybody who need to perform statistical analysis of data and process useful information from data using various mechanisms, such as classification, regression and text analysis. Currently, R has 782K lines of code which has increased from 82K lines of codes in 1997(about 35% C, 31% FORTRAN and 20% R) [4]. Changes in the code to base R are an exclusive domain of the core team members of R. Till now a total of twenty five members of R-core have contributed to R, Currently R-core has twenty members.

1.1 Characteristics of R

R is a programming language wherein data analysis is carried out by writing functions and scripts. However R is an easy language to learn. R is characterized by an extensive set of library functions which can implement not only mathematical but techniques of other disciplines like graphical, classification,

AIP Publishing **AIP Advances**

Volume 9, Issue 4
April 2019



RESEARCH ARTICLE | APRIL 03 2019

Dynamics of a vertically vibrating mercury drop

Tanu Singla; Dinesh Kumar Verma; Josué Flores Tovar; A. Figueroa ; Federico Vázquez; Farook Bashir Yousif ; M. Rivera

+ Author & Article Information
AIP Advances 9, 045204 (2019)
https://doi.org/10.1063/1.5088043 Article history

The dynamics of vertically vibrating liquid drops has been studied by several researchers and different phenomena have been reported. In the present work, we report experimental results for some interesting phenomena that can be observed in a liquid drop subjected to vertical vibrations.

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Journal of Hazardous Materials

Volume 370, 15 May 2019, Pages 126-137

Fabrication and characterization of ZnO-TiO_2-PANI (ZTP) micro/nanoballs for the detection of flammable and toxic gases

Rakesh K. Sonker [a b], B.C. Yadav [b], Vinay Gupta [a], Monika Tomar [c]

https://doi.org/10.1016/j.jhazmat.2018.10.016

Abstract

The present paper reports the in-situ chemical polymerization of nanocomposites thin film composed by titanium dioxide (TiO_2), zinc oxide (ZnO) and polyaniline (PANI). It was found that nanocomposites sensor is highly selective and shows response to low concentration. To improve the sensing response characteristics of ZT thin film, PANI is incorporated. Thin film based LPG sensor of ZnO-TiO_2-PANI composite was fabricated by spin coating of ZnO-TiO_2 nanoparticles doped with PANI over inter digital electrodes (IDEs). The thin film was characterized by using XRD, SEM, TEM, UV–vis, BET and FTIR. It was also tested for gas sensing properties of LPG/NO_2 which are well known flammable and toxic gases. The measured response for ZnO-TiO_2-PANI based sensor was 87 for 2000 ppm of LPG and 412 for 20 ppm of NO_2 at room temperature towards other testing gases together with Acetone, IPA, NH_3 and CO_2.

ELSEVIER

Journal of Molecular Liquids

Volume 290, 15 September 2019, 111241

Investigation of thermodynamical, dielectric and electro-optical parameters of nematic liquid crystal doped with polyaniline and silver nanoparticles

Tripti Vimal [a], Kaushlendra Agrahari [a], Rakesh Kumar Sonker [b], Rajiv Manohar [a]

https://doi.org/10.1016/j.molliq.2019.111241

Abstract

In the present investigation, thermo-dynamical, dielectric & electro-optical characterization of a neamtic liquid crystal (NLC) and its mixtures with polyaniline (PANI) & silver nanoparticles (Ag NPs) have been carried out. To visualize the combined effect of polyaniline and silver nanoparticles, a polyaniline/silver nanocomposite has been prepared. Equal concentration of polyaniline, silver nanoparticles & polyaniline/silver nanocomposite has been taken and doped into the pure NLC material. A comparison of various LC parameters of pure NLC material and its mixtures with different dopant has also been done. Thermodynamical study suggests that the presence of polymer and nanoparticles duo in LC can tune the order parameter of LC material.

ELSEVIER

Applied Surface Science

Volume 479, 15 June 2019, Pages 326-333

Full length article

Synthesis and characterization of highly porous hexagonal shaped CeO_2-Gd_2O_3-CoO nanocomposite and its opto-electronic humidity sensing

Samiksha Sikarwar [a], B.C. Yadav [a], Rakesh K. Sonker [b], G.I. Dzhardimalieva [c], Jeevitesh K. Rajput [d]

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https://doi.org/10.1016/j.apsusc.2019.02.108

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Abstract

The present paper reports the synthesis and fabrication of CeO_2-Gd_2O_3-CoO nanocomposite films using metal carboxylates as precursors. The refractive index of the film was found as 1.445538. The crystallinity was confirmed from XRD and the minimum crystallite size calculated was 9 nm. TEM analysis showed the hexagonal crystals where the minimum dimension was obtained as 6 nm. The dimensionality was further confirmed by Particle Size Analyzer. The film was then examined using SEM which revealed highly porous nature of the material. UV–Vis spectrophotometer found the absorption of the film taking place in UV-region and the optical band-gap as determined

Chaos. 2019 May;29(5):053112. doi: 10.1063/1.5083179.

Entrainment of aperiodic and periodic oscillations in the Mercury Beating Heart system using external periodic forcing

Pawan Kumar [1], P Parmananda [1], Dinesh Kumar Verma [2], Tanu Singla [2], Iram de Nicolás [2], J Escalona [2], M Rivera [2]

Affiliations + expand

PMID: 31154773 DOI: 10.1063/1.5083179

Abstract

We report experimental results indicating entrainment of aperiodic and periodic oscillatory dynamics

EurJOC
European Journal of Organic Chemistry

Chemistry Europe
European Chemical Societies Publishing

Volume 2019, Issue 1
January 10, 2019
Pages 150-155

Full Paper

Recyclable Organocatalyst for One-Pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone Spirooxindoles

Miao Liu, Xiaofeng Zhang, Xin Huang, Gagan Dhawan, Jason Evans, Manpreet Kaur, Jerry P. Jasinski, Wei Zhang

First published: 04 October 2018 | https://doi.org/10.1002/ejoc.201801480 | Citations: 11

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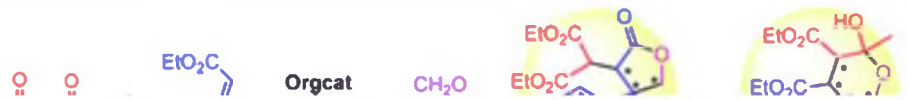
Graphical Abstract

Recyclable fluorous bifunctional organocatalyst-promoted one-pot Michael/aldol/cyclization sequence affords asymmetric dihydrofuranone or tetrahydropyranone spirooxindoles in 39–82 % yields with 3:1 to 6:1 *dr* and up to 99 % *ee* for the major diastereomers



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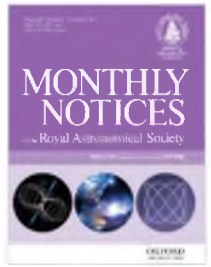

Volume 489, Issue 3
November 2019

Article Contents

JOURNAL ARTICLE

Morphology of the Small Magellanic Cloud using multiwavelength photometry of classical Cepheids

Sukanta Deb ✉, Kerdaris Kurbah, Harinder P Singh, Shashi M Kanbur, Chow-Choong Ngeow, Biman J Medhi, Subhash Kumar

Monthly Notices of the Royal Astronomical Society, Volume 489, Issue 3, November 2019, Pages 3725–3738, https://doi.org/10.1093/mnras/stz2328

Published: 22 August 2019 **Article history** ▾

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ABSTRACT

This is the second of a series related to the study of geometry of the Magellanic Clouds based on multiwavelength photometry of classical Cepheids. In this paper we determine the geometrical and viewing angle parameters of the Small Magellanic Cloud (SMC) using the Leavitt law for classical Cepheids with/without a break in the law at a certain period as reported in the literature.

Theoretical and experimental investigation on structural stability, electronic and vibrational properties of polyaniline (PANI)

저널정보

장전수학회

Proceedings of the Jangjeon Mathematical Society | 학술저널

Proceedings of the Jangjeon Mathematical Society Vol.22 No.1

2019.1 | 129 - 139 (11page)

저자정보

Rakesh K. Sonker (University of Delhi)

Rajkamal Shastri (Babasaheb Bhimrao Ambedkar University)

B.C. Yadav (Babasaheb Bhimrao Ambedkar University)

Article | Open Access | Published: 15 October 2020

Structural basis of peroxidase catalytic cycle of human Prdx6

Rimpy Kaur Chowhan, Hamidur Rahaman & Laishram Rajendrakumar Singh

Scientific Reports **10**, Article number: 17416 (2020) | Cite this article

1770 Accesses | **7** Citations | Metrics

Abstract

Peroxiredoxin 6 (Prdx6) is a ubiquitously expressed antioxidant non-selenium glutathione peroxidase that is known to play a major role in various physiological and pathological processes. It belongs to the family of peroxidases (referred to as Peroxiredoxins, Prdx's) that work independently of any prosthetic groups or co-factors, and instead utilize a peroxidatic thiol residue for peroxide reduction. Mammalian Prdx's are classified according to the number of Cys implicated in their catalytic activity by the formation of either inter-molecular (typical 2-Cys, Prdx1–4) or intra-molecular (atypical 2-Cys, Prdx5) disulfide bond, or non-covalent

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Abstract

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Materials and methods

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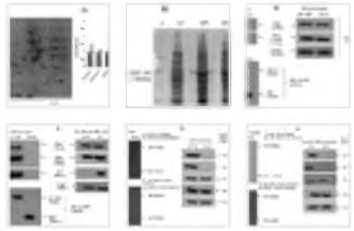

Virology
Volume 549, October 2020, Pages 59-67

Experimental validation of influenza A virus matrix protein (M1) interaction with host cellular alpha enolase and pyruvate kinase

Shruti Mishra [1], Priya Goyal [1], Deepshikha Kumar, Rajan Chaudhari, Maitreyi S. Rajala

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https://doi.org/10.1016/j.virol.2020.07.019

Abstract

Influenza A virus, a respiratory pathogen manipulates various host cellular processes to establish a successful infection in a host. We had reported earlier the interaction of influenza A virus nucleoprotein with host glycolytic enzymes; alpha enolase and pyruvate kinase in A549cells. Matrix protein (M1), another multifunctional protein encoded by genome segment 7 forms the inner layer of the virion and interacts with the ribonucleoprotein complex. Nucleoprotein and matrix protein, major structural components of the virion together contribute to the stability of the capsid. Thus, we have investigated the interaction of viral matrix protein with host glycolytic enzymes; alpha enolase and pyruvate kinase. Results had demonstrated differential expression of these two glycolytic enzymes in response to matrix protein and their interaction with matrix protein by *in vitro* binding, co-immunoprecipitation and co-localization studies. Our results confirmed that viral matrix protein interacts with host glycolytic enzymes in association with viral nucleoprotein.

Previous article in issue Next article in issue

Materials Research Express

PAPER • OPEN ACCESS

Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films

Vishal Dhingra[1,3], Shani Kumar[1,3], Ravi Kumar[4], Amit Garg[1] and Arijit Chowdhuri[2]

Published 19 June 2020 • © 2020 The Author(s). Published by IOP Publishing Ltd

Materials Research Express, Volume 7, Number 6

Citation Vishal Dhingra *et al* 2020 *Mater. Res. Express* **7** 065012

DOI 10.1088/2053-1591/ab9ae7

Article PDF

Figures References

+ Article and author information

Abstract

Graphene based 2D materials with a surfeit of active sites and advantageously high surface to volume ratio are effectively linked to well established nanostructured semiconducting metal oxides for development of nanocomposites with enhanced gas sensing properties. Graphene Oxide (GO), a sister material of graphene, is therefore a natural choice for development of room temperature operated gas sensors. In the current investigation hydrothermally grown GO and ZnO nanorods composite (GO–ZnO–NR) is utilised for room temperature gas sensing of H_2 and SO_2 gases. Room temperature

Technical Paper | Published: 17 March 2020

Extraction of admittance parameters of symmetrically doped AlGaN/GaN/AlGaN DH-HEMT for microwave frequency applications

Nisha Chugh, Manoj Kumar, Monika Bhattacharya & R. S. Gupta

Microsystem Technologies **27**, 4065–4072 (2021) | Cite this article

Abstract

An analytical model for determining intrinsic short-circuit admittance (Y) parameters of AlGaN/GaN/AlGaN Double Heterostructure (DH) High Electron Mobility Transistor (HEMT) is presented. These Y parameters obtained in terms of the various small signal equivalent circuit parameters are in turn used to evaluate the enhanced microwave performance of the DH-HEMT in terms of various parameters including Unilateral Power Gain and maximum oscillation frequency. The cut-off frequency has been evaluated from short circuit current gain. The cut-off frequency (f_T) and maximum oscillation frequency (f_{max}) exhibited for DH-HEMT is 125 GHz and 215 GHz which is comparatively improved as obtained in Single

ELSEVIER

Materials Chemistry and Physics

Volume 239, 1 January 2020, 121975

Synthesis of CdS nanoparticle by sol-gel method as low temperature NO_2 sensor

Rakesh K. Sonker [a b], B.C. Yadav [b], Vinay Gupta [a], Monika Tomar [c]

https://doi.org/10.1016/j.matchemphys.2019.121975

Abstract

In the present work, NO_2 gas sensor based on Cadmium sulfide (CdS) nanostructures were prepared by using the chemical route technique. CdS thin films of different thickness were prepared by spin coating technique with different speed (1000, 2000 and 3000 rpm). Prepared thin films were characterized by techniques, such as X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Fourier Transform Infrared spectroscopy (FT-IR) and Ultraviolet–Visible spectroscopy (UV–Vis), which offered the information about the chemical structure and morphology of CdS thin film. Gas sensing measurements for detecting

Advances in Zoology and Botany

Advances in Zoology and Botany Vol. 8(1), pp. 12 - 19
DOI: 10.13189/azb.2020.080103
Reprint (PDF) (926Kb)

Optimizing Synthesis of Citrus limetta Peel Silver Nanocomposites Possessing Larvicidal Potential against Dengue Vector, Aedes aegypti L.

Devina Aggarwal [1], Aarti Sharma [2], Sarita Kumar [3,*]

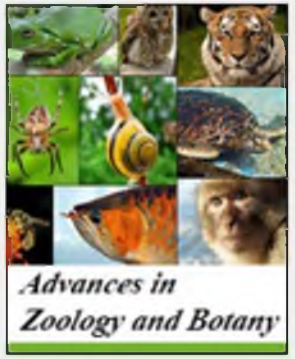
[1] Department of Science, Modern School, New Delhi, India

[2] Department of Life Sciences (SOS), Indira Gandhi National Open University, New Delhi, India

[3] Department of Zoology, Acharya Narendra Dev College, University of Delhi, New Delhi, India

ABSTRACT

Aedes aegypti L. is the major vector accountable for the spread of several diseases of medical importance. The control strategies primarily relying on chemical insecticides have caused negative impact on our environment and human health. Thus, current study employed Citrus limetta peel extracts (CLPE) against larvae of Ae. aegypti. Silver nanocomposites (AgNCs) from CLPE were synthesised and the process of synthesis was optimized by varying temperature; volume and concentration of silver nitrate



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ORIGINAL ARTICLE

One-pot synthesis of silver nanocomposites from *Achyranthes aspera*

An eco-friendly larvicide against *Aedes aegypti* L.

Sharma, Aarti[1]; Tripathi, Pushplata[1]; Kumar, Sarita[2],

Author Information

Asian Pacific Journal of Tropical Biomedicine 10(2):p 54-64, February 2020. | *DOI:* 10.4103/2221-1691.275420

OPEN

Abstract

Objective:

To formulate **silver nanocomposites from *Achyranthes aspera*** leaf extracts and evaluate its larvicidal activity against *Aedes aegypti*.

Methods:

The **silver nanocomposites** were synthesized **from *Achyranthes aspera*** leaf extracts. The process was optimized and traced through UV-visible and photon correlation spectroscopy. The larvicidal potential of **silver nanocomposites** of ***Achyranthes aspera*** leaf extracts was assessed against the early fourth instars of

Original Research Article | Published: 28 May 2020

Effect of dietary stress of emamectin benzoate on the fitness cost of American bollworm, *Helicoverpa armigera* (Hübner, 1808)

Vinay Singh Dagar, Monika Mishra & Sarita Kumar

International Journal of Tropical Insect Science **40**. 1069–1077 (2020) | Cite this article

Abstract

Present study assessed the effect of Emamectin benzoate (EMB) on the survival, growth and nutrition efficiency of *Helicoverpa armigera*. Dietary EMB exhibited a significant systemic toxicity in *H. armigera* larvae resulting in LD_{50} and LD_{90} value of 0.092 µg/mL and 0.156 µg/mL, respectively. Feeding with 0.05–0.2 µg/mL EMB caused 10–100% larval mortality in a dose-dependent manner. Feeding the IV instars of *H. armigera* with 0.1–1.6 µg/mL EMB-incorporated diet deterred feeding significantly. Substantial deterrent effects of EMB with lower LD_{50} values indicate the noteworthy systemic toxicity of EMB on the *H. armigera* larvae. Both choice and no-choice bioassay with dietary EMB showed a distinct preference of

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Volume 72 Issue 1

Archives of Biological Sciences 2020 Volume 72, Issue 2, Pages: 271-278
https://doi.org/10.2298/ABS200308021M
Full text (181 KB)
Cited by

Effects of β-sitosterol on growth, development and midgut enzymes of Helicoverpa armigera Hübner

Mishra Monika *(Department of Zoology, Acharya Narendra Dev College (University of Delhi), Kalkaji, New Delhi, India)*
Sharma Aarti *(Department of Zoology, Acharya Narendra Dev Coellege (University of Delhi), Kalkaji, New Delhi, India)*
Dagar Vinay Singh *(Department of Zoology, Acharya Narendra Dev College (University of Delhi), Kalkaji, New Delhi, India)*
Kumar Sarita *(Department of Zoology, Acharya Narendra Dev College (University of Delhi), Kalkaji, New Delhi, India)*

Helicoverpa armigera is a global agricultural pest of serious concern. Continued use of chemical insecticides as control measures has raised grave health and environment concerns, necessitating a search for botanicals as safe alternatives. The current study investigates the effects of β-sitosterol, a bioactive phytocomponent in Thevetia neriifolia, on the growth and development, as well as on midgut enzymes of H. armigera. Dietary β-sitosterol produced dose-dependent systemic toxicity and growth inhibitory effects in H. armigera; the most significant effects were obtained with 10 µg/mL dietary β-sitosterol. Higher prepupal and pupal mortality in comparison to larval mortality and a comparatively greater reduction in average weight gained by later instars point to cumulative effects of β-sitosterol. The delayed effects were ascertained by the 82.05%-57.89% reduction in adult emergence in comparison to 95.02% emergence in controls. Dose-dependent effects of β-sitosterol were observed as significantly decreased enzyme activities of alanine aminotransaminase (ALT), aspartate aminotransaminase (AST) and alkaline phosphatase (ALP) in the larval midgut. Suppression of enzyme activity was obtained in the order ALT>AST>ALP. Impaired activity of gut enzymes possibly lowered the energy reserves and affected nutrient transport through the gut epithelium, affecting the growth and development of H. armigera. Our study points to a promising use of β-sitosterol against H. armigera, although further examination and field studies are needed to ascertain its possible use in control programs.

Keywords: Helicoverpa armigera, β-sitosterol, alanine aminotransaminase, aspartate aminotransaminase, alkaline phosphatase

Mini-Review | Published: 25 May 2020

Potential applications of extracellular enzymes from *Streptomyces* spp. in various industries

Munendra Kumar, Prateek Kumar, Payal Das, Renu Solanki & Monisha Khanna Kapur

Archives of Microbiology **202**, 1597–1615 (2020) | Cite this article

1418 Accesses | **24** Citations | Metrics

Abstract

Extracellular enzymes produced from *Streptomyces* have the potential to replace toxic chemicals that are being used in various industries. The endorsement of this replacement has not received a better platform in developing countries. In this review, we have discussed the impact of chemicals and conventional practices on environmental health, and the role of extracellular enzymes to replace these practices. Burning of fossil fuels and agriculture residue is a global issue, but the production of biofuel using extracellular enzymes may be the single key to solve all these issues. We have discussed the replacement of hazardous chemicals with the use of xylanase, cellulase, and pectinase in food industries. In paper industries, delignification was done by the chemical treatment, but xylanase and laccase have the efficient

Journal of King Saud University - Science
Volume 32, Issue 4, June 2020, Pages 2316-2328

Original article

Description of a new species of *Tetmemena* (Ciliophora, Oxytrichidae) using classical and molecular markers

Renu Gupta [a], Jeeva Susan Abraham [b], S. Sripoorna [b], Swati Maurya [b], Ravi Toteja [b], Seema Makhija [b], Fahad A. Al-Misned [c], Hamed A. El-Serehy [c]

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https://doi.org/10.1016/j.jksus.2020.03.009 Get rights and content

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Abstract

Tetmemena saprai n. sp. was isolated from fresh-water samples collected from Okhla Bird Sanctuary, Delhi, India and described based on its morphology, morphogenesis and molecular markers, namely the small-subunit (SSU) rRNA gene and internal transcribed spacers (ITS1-5.8S-ITS2). The morphological features of *T. saprai* n. sp. are as follows:

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Volume 5, Issue 11
March 20, 2020
Pages 3420-3433

Full Paper | Free Access

Spiro-Indole-Coumarin Hybrids: Synthesis, ADME, DFT, NBO Studies and In Silico Screening through Molecular Docking on DNA G-Quadruplex

Dr. Leena Khanna, Sugandha Singhal, Prof. Dr. Subhash C. Jain, Dr. Pankaj Khanna

First published: 19 March 2020 | https://doi.org/10.1002/slct.201904783 | Citations: 9

Graphical Abstract

Six new hybrids, spiro[indol-indazole-thiazolidine]-dione-coumarin hybrids (10a-c) and spiro[indol-pyrazole-thiazolidine]-dione-coumarin hybrids (12a-c), were synthesized successfully *via* hitherto unknown Schiff bases. These compounds were virtually screened for their drug likeliness, toxicity and docking interactions with DNA G-quadruplex (compared with library of known compounds). The Density Functional Theory (DFT) electronic reactivity descriptors, depicted their high chemical reactivity and the Molecular Electrostatic Potential (MEP) and contour plots described their potential active sites. Further, the detailed Natural bond order (NBO) analysis of these hybrids suggested

Recommended

Virtual Screening, Molecular Docking, and DFT Studies of Some Thiazolidine-2,4-diones as Potential PIM-1 Kinase Inhibitors

Vivek Asati, Santosh S. Thakur, Neeraj Upmanyu, Sanjay K. Bharti

ChemistrySelect

Molecular Structure, Spectral, Electronic and Thermodynamic, First-Order Hyperpolarizability, NBO and Molecular Docking Studies of Novel Acenaphthylene Pyrrolidine Derivative

Original research article | Published: 27 May 2020

Biogenic Silver Nanoparticles: Evaluation of Their Biological and Catalytic Potential

Bhawna Sharma, Indu Singh, Somvir Bajar, Seema Gupta, Hemant Gautam & Pradeep Kumar

Indian Journal of Microbiology **60**, 468–474 (2020) | Cite this article

455 Accesses | **11** Citations | Metrics

Abstract

The biogenic tailoring of silver nanoparticles using plant extract is becoming an attractive approach in the current scenario. *Manilkara zapota* (MZ) is well known for its antibacterial, hepato-protective, anti-inflammatory, anti-tussive, anti-fungal, anti-tumour, and free radical scavenging potential. Its plants extract is a rich source of secondary metabolites. Nowadays, silver nanoparticles (AgNPs) have been advocated for a variety of biomedical applications. In present work, silver nanoparticles have been synthesized using an aqueous extract of MZ, physicochemically characterized and finally evaluated for antimicrobial effects, catalytic reduction/degradation of organic dyes and cytotoxicity. The nanosized AgNPs (~ 84 nm) were found to possess prominent antibacterial potential against gram positive and gram negative

REVIEW article

Front. Bioeng. Biotechnol., 29 May 2020
Sec. Nanobiotechnology
Volume 8 - 2020 | https://doi.org/10.3389/fbioe.2020.00504

This article is part of the Research Topic
Functionalized Nanocarriers for Theranostics
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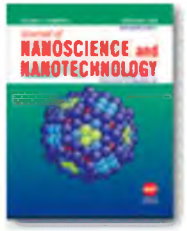
Ultrashort Peptide Self-Assembly: Front-Runners to Transport Drug and Gene Cargos

Seema Gupta[1*] Indu Singh[1,2] Ashwani K. Sharma[2*] Pradeep Kumar[2*]

[1] Chemistry Department, Acharya Narendra Dev College, University of Delhi, New Delhi, India
[2] Nucleic Acids Research Laboratory, CSIR-Institute of Genomics and Integrative Biology, New Delhi, India

The translational therapies to promote interaction between cell and signal come with stringent eligibility criteria. The chemically defined, hierarchically organized, and simpler yet blessed with robust intermolecular association, the peptides, are privileged to make the cut-off for sensing the cell-signal for biologics delivery and tissue engineering. The signature service and insoluble network formation of the peptide self-assemblies as hydrogels have drawn a spell of research activity among the scientists all around the globe in the past decades. The therapeutic peptide market players are anticipating promising growth opportunities due to the ample technological advancements in this field. The presence of the other organic moieties, enzyme substrates and well-established protecting groups like Fmoc and Boc etc., bring the best of both worlds. Since the large sequences of peptides severely limit the purification and their isolation, this article reviews the account of last 5



Adsorption of Rhodamine 6G Dye on Binary System of Nanoarchitectonics Composite Magnetic Graphene Oxide Material

Authors: Gautam, Drashya; Lal, Shyam; Hooda, Sunita
Source: Journal of Nanoscience and Nanotechnology, Volume 20, Number 5, May 2020, pp. 2939-2945(7)
Publisher: American Scientific Publishers
DOI: https://doi.org/10.1166/jnn.2020.17442

Magnetic Graphene Oxide nanocomposite prepared by the co-precipitation method based on concept of nanoarchitectonics. In co-precipitation method, Graphene oxide converts into Magnetic graphene oxide nanocomposite with uniform deposition of Fe_3O_4 nano particles on the surface of Graphene oxide. Field Emission Scanning Electron Microscopy spectroscopy technique reveals the size (~2.5 nm) and uniformity of Fe_3O_4 nano particles on Graphene oxide surface. The other properties characterized by Scanning electron microscopy, Raman spectroscopy, X-ray powder diffraction, X-ray photoelectron spectroscopy and vibrating-sample magnetometer. For Adsorption process, time, temperature, dose of adsorbent, initial concentration of dye solution and pH factors are optimize for Rhodamine 6G dye. Kinetic data expressed by Pseudo first order model and Pseudo second order model. Langmuir, Freundlich and Temkin isotherms used to evaluate the adsorption isotherm of Rhodamine 6G onto the surface of Magnetic graphene oxide nanocomposite and thermodynamic parameters tell us about the nature of reaction.

Keywords: Adsorption; Graphene Oxide; Isotherm; Kinetics; Rhodamine 6G; Thermodynamic Parameters
Document Type: Research Article
Affiliations: Department of Chemistry, Acharya Narendra Dev College (University of Delhi), Govindpuri, Kalka ji, NewDelhi 110019, India
Publication date: 1 May, 2020

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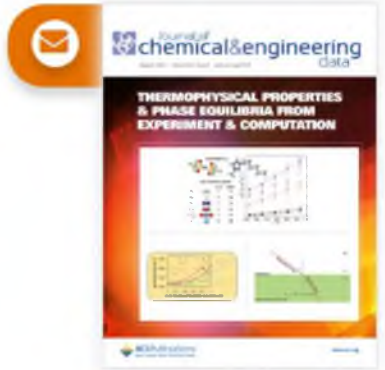
Magnetic Graphene Oxide/Chitin Nanocomposites for Efficient Adsorption of Methylene Blue and Crystal Violet from Aqueous Solutions

Drashya Gautam and Sunita Hooda*

Cite this: *J. Chem. Eng. Data* 2020, 65, 8, 4052−4062
Publication Date: August 3, 2020
https://doi.org/10.1021/acs.jced.0c00350

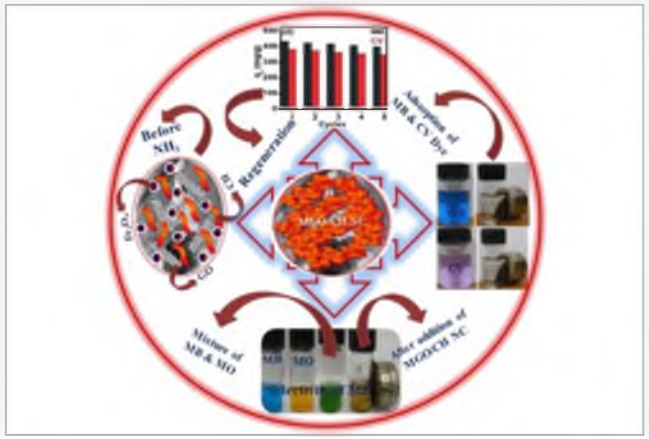


Journal of Chemical & Engineering Data

SUBJECTS: Adsorption, Dyes and pigments, Nanocomposites, Nanoparticles,

Abstract

The present study is focused on the synthesis of prominent magnetic graphene oxide/chitin nanocomposites, which behaves as an adsorbent for organic dyes under visible light. The nanocomposites were characterized using physicochemical techniques such as X-ray diffraction, Fourier transform infrared spectroscopy, Raman spectroscopy, vibrating-sample magnetometer, scanning electron microscopy, and transmission electron microscopy. A band gap energy of 2.01 eV was evaluated from Tauc and Davis–Mott plots. Batch adsorption studies were performed on crystal violet and methylene blue dyes with varying parameters such as time, pH, concentration, dosage, and temperature, which resulted to excellent adsorption activities of 403.78 mg/g for crystal violet and 332.61 mg/g for methylene blue. The as-synthesized nanocomposite showed excellent recovery capability, retaining its adsorption efficiency even after nine cycles of regeneration. The adsorption equilibrium data fitted well into the pseudo-second-order model and Langmuir isotherm model, while the spontaneity and exothermic nature of the adsorption phenomenon are demonstrated by thermodynamic studies. A comparative adsorption study results to a selective adsorption of cationic dyes over anionic ones, which goes in conformity with the high negative value of zeta potential obtained at



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Appl. Appl. Math.
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Vol. 15, Issue 1 (June 2020), pp. 273 – 281

Applications and Applied
Mathematics:
An International Journal
(AAM)

Complexity Dynamics of Gumowski-Mira Map

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Received: January 4, 2020; Accepted: April 27, 2020

Abstract

In the context of nonlinear dynamics, interesting dynamic behavior of Gumowski-Mira Map has been noted under various feasible circumstances. Evolutionary phenomena are discussed through the study of bifurcation analysis leading to period-doubling and chaos. The appearance of chaos in the method is identified by plotting Lyapunov characteristic exponents (LCE) and Topological Entropy within certain parameter range. Dynamic Lyapunov Indicator (DLI) has been procured for further identification of regular and chaotic motions of the Gumowski-Mira Map. The numerical results through the indicator DLI clearly demonstrate the behavior of our map. The correlation dimension has been calculated numerically for the dimension of the chaotic attractor.

Keywords: Bifurcation; Chaos indicators; Topological entropy; Correlation dimension

MSC 2010 No.: 37G15, 37D45

CHAOS MEASURE IN AUTONOMOUS LPA MODEL

Sada Nand Prasad[1], L. M. Saha[2] and Abdulah A. Ansari[3,*]

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*. Corresponding Author

June 20, 2020

Abstract

The discrete autonomous LPA model of dynamical systems investigated for regular and chaotic evolutions under different feasible conditions in the framework of nonlinear dynamics. Evolutionary phenomena discussed through bifurcation analysis leading to chaos. As part of chaos measure, numerical calculations performed to obtain Lyapunov characteristic exponents (LCE), Topological Entropy, correlation dimension etc. The results obtained by numerical calculations are demonstrated through various graphics. Chaotic evolutions discussed at critical set of parameters, which reveals very significant results. Correlation dimension, which provides dimensionality of an attractor (Strange/Chaotic), obtained numerically by the use of certain statistical method.

Keywords: Autonomous LPA model, Bifurcation, Lyapunov Characteristic Exponents, Topological Entropy, Correlation Dimension.

1 Introduction

Mathematical models expressing real phenomena are mostly nonlinear in nature. Their evolutionary dynamical behavior often shows properties like unpredictability and chaos attracting researchers obtaining interesting results [4; 5; 24]. The model on population dynamics and ecology are frequently used models and most considerable problems in dynamical systems. Investigators generally prefer to use difference equation while describing mathematical models in context of biological models. Numerous articles have appeared on such models after publication of articles by R. May [17; 18] with reasonable assumption of evolution processes of population in concerned. Such studies generate quite interesting results.

Many nonlinear systems exhibit chaos in some parameter space but in some cases within the system because of the interaction among different agents, complexity character also visible during evolution. Unpredictable motion is thus a mix phenomenon of chaos and complexity. Presence of complexity is responsible of coexistence of multiple attractors, bistability, intermittency, cascading effects, exhibit of hysteresis properties, and some more properties, [3; 6; 9; 26]. Chaotic evolution measured by positivity of Lyapunov exponents, (LCEs), whereas its negative value signifies the system is regular, [2; 8; 13]. Complexity measured by increase of topological entropy; more increase in topological entropy signifies the system is more complex. [7; 14; 15; 21; 22; 27].

Evolution in insects considered metamorphosis since big changes observed during their growth and development. Insect evolution passes through four clearly different stages: egg, larvae, pupae and adult. Class of such insects listed as butterflies, moths, beetles, flies, bees, wasps, and ants. Changing from one stage to another an insect has to molt its skin and each time it emerge larger and of different form until it reaches the adult stage. [10]. Some

Supply Chain Model for Expiring Items Following Ramp-Type Demand With Stochastic Lead Time Under Crisp and Fuzzy Environment

Chaman Singh, S.R. Singh

Source Title: International Journal of Fuzzy System Applications (IJFSA) 9(1)
Copyright: © 2020 | Volume: 9 | Issue: 1 | Pages: 28
ISSN: 2156-177X | EISSN: 2156-1761 | EISBN13: 9781522598411 | DOI: 10.4018/IJFSA.2020010103

Abstract

Supply chain models with deteriorating items, season pattern demand, expiration and uncertain lead time, though common in practice; had received little attention from researchers. In this article, the authors proposed a collaborative system with ramp type seasonal pattern demand rate for expiring items with supplier's random lead time under crisp and fuzzy environment considering the effect of inflation and time value of money. For the seasonal kind of items, demand rate follows the combination of increasing-steady-decreasing demand patterns. A supplier's lead time is a stochastic function of his managing cost; thus, the extra costs incurred on the retailer due to the uncertainty in lead time in terms of shortages costs and lost sales costs are owed by the supplier. Numerical examples are cited to illustrate the results and its significant features. Finally, to study the effect of change of parameters sensitivity analysis is presented and necessary observations are made.

1. Introduction

In the existing literature, most of the inventory/supply chain model was developed considering three types of demand rates: (i) constant demand rate; (ii) linearly positive/negative demand rate; and (iii) exponentially increasing/decreasing demand rate. However, demand for a commodity cannot increase/decrease continuously over time. It is observed that demand for seasonal products like fruits and the fashionable products over the entire time horizon is three folded. At the beginning of the season demand increases more rapidly, as the time passes, it becomes steady in the middle of the season and decreases more rapidly towards the end of the season and becomes asymptotic. The term "ramp type" is used to represent such kind of demand pattern. In the existing inventory and supply chain models, after the development of classical economic ordering quantity model by Wilson (1934) under the assumption of constant demand rate, researchers extensively studied several aspects of inventory and supply chain modeling by assuming time-dependent demand rate. The assumption of constant demand rate is usually valid in the mature stage of a product's life cycle. In the growth and/or end-stage life cycle, demand rate may well be approximated by a time-dependent function. Resh et al. (1976) were the first who developed a model with linearly time-varying demand. Hill (1995) first resolved the indiscipline of time-dependent demand pattern by considering the demand

Outline

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International Journal of Biological Macromolecules

Volume 149, 15 April 2020, Pages 1139-1150

The anti-oxidant enzyme, Prdx6 might have *cis-acting* regulatory sequence(s)

Sharifun Shahnaj [a], Angamba Meetei Potshangbam [a], Rimpy Kaur Chowhan [b], Zahoor Ahmad Parray [c], Pushpa Kakchingtabam [a], Anju Kumari [b], Asimul Islam [c], Aslam Khan [d], Laishram Rajendrakumar Singh [b], Hamidur Rahaman [a]

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https://doi.org/10.1016/j.ijbiomac.2020.01.311

Abstract

Peroxiredoxin 6 (Prdx6) is a ubiquitously expressed 1-cysteine Peroxiredoxin found throughout all phyla. In mammals, under different physiological conditions, it has evolved from a peroxidase to a multifunctional enzyme. Among the mammalian Prdx6's, human and rat Prdx6's are the most extensively studied. Our study revealed that human and rat Prdx6's exhibit differences in their peroxidase activity. These two Prdx6's have only 8% difference in their primary sequence (with 19 amino acids) with no apparent

ORIGINAL RESEARCH | VOLUME 25, ISSUE 1, P70-78, JANUARY 2020 Download Full Issue

Screening of Antitubercular Compound Library Identifies Inhibitors of Mur Enzymes in *Mycobacterium tuberculosis*

Kandasamy Eniyan * • Jyoti Rani * • Srinivasan Ramachandran • Rahul Bhat • Inshad Ali Khan • Urmi Bajpai • Show footnotes

Open Access • DOI: https://doi.org/10.1177/2472555219881148

Abstract

The rapid rise in the emergence of multidrug-resistant (MDR) and extensively drug-resistant (XDR) strains of *Mycobacterium tuberculosis* (Mtb) mandates the discovery of novel tuberculosis (TB) drugs. Mur enzymes, which are identified as essential proteins in Mtb and catalyze the cytoplasmic steps in the peptidoglycan biosynthetic pathway, are considered potential drug targets. However, none of the clinical drugs have yet been developed against these enzymes. Hence, the aim of this study was to identify novel inhibitors of Mur enzymes in *Mycobacterium tuberculosis*. We screened an antitubercular compound library of 684 compounds, using MurB and MurE enzymes of the Mtb Mur pathway as drug targets. For experimental validation, the top hits obtained on in silico screening were screened in vitro, using Mtb Mur enzyme-specific assays. In all, seven compounds were found to show greater than 50% inhibition, with the highest inhibition observed at 77%, and the IC_{50} for these compounds was found to be in the range of 28–50 µM. Compound 5175112 showed the lowest IC_{50} (28.69 ± 1.17 µM), and on the basis of (1) the binding affinity, (2) the stability of interaction noted on

Outline

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Virus Research

Volume 279, 2 April 2020, 197884

Characterization and genome analysis of B1 sub-cluster mycobacteriophage PDRPxv

Avni Sinha [a 1], Kandasamy Eniyan [a b 1], Prasanth Manohar [b], Nachimuthu Ramesh [b], Urmi Bajpai [a]

https://doi.org/10.1016/j.virusres.2020.197884

Highlights

- A mycobacteriophage PDRPxv was isolated from soil sample using *Mycobacterium smegmatis* as host.
- Mycobacteriophage PDRPxv belongs to the *Siphoviridae* family.
- The complete genome sequence of mycobacteriophage PDRPxv was determined.

Original Paper | Published: 28 May 2020

Functional characterization of the endolysins derived from mycobacteriophage PDRPxv

Kandasamy Eniyan, Avni Sinha, Shazeb Ahmad & Urmi Bajpai

World Journal of Microbiology and Biotechnology **36**, Article number: 83 (2020) | Cite this article

Abstract

Bacteriophage-derived endolysin enzymes play a critical role in disintegration of the host bacterial cell wall and hence have gained considerable attention as possible therapeutics for the treatment of drug-resistant infections. Endolysins can target both dividing and non-dividing cells and given the vital role peptidoglycan plays in bacterial survival, bacteria are less likely to modify it even if continuously exposed to lysins. Hence, probability of bacteria developing resistance to lysins appear bleak. Endolysins from mycobacteriophages offer great potential as alternative therapeutics for the drug-resistant TB. However, considering that a large number of mycobacteriophages have been discovered so far, the information on endolysins come from only a few mycobacteriophages. In this study, we report the structural

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Estimating Parameter of the Selected Uniform Population Under the Generalized Stein Loss Function

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Abstract

This paper deals with the problem of estimating scale parameter of the selected uniform population when sample sizes are unequal. The loss has been measured by the generalized Stein loss (GSL) function. The uniformly minimum risk unbiased (UMRU) estimator is derived, and the natural estimators are also constructed under the GSL function. One of the natural estimators is proved to be the generalized Bayes estimator with respect to a noninformative prior. For $k = 2$, we obtained a sufficient condition for an inadmissibility result and demonstrate that the natural estimator and UMRU estimator are inadmissible. A simulation investigation is also carried out for the performance of the risk functions of various competing estimators. Finally, this article represents a conclusion of our study.

Keywords: Generalized Stein loss (GSL) function; Uniform distributions; Inadmissibility; UMRU estimator; Natural estimators; Selection rule; Entropy loss function

MSC 2010 No.: 62E10, 62M90, 60G70, 60E05, 62E10, 62E15

Reliable Path Finding Technique for Mobile Robot

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Abstract - Path planning techniques of mobile robot (Automated Vehicle) is discussed in this paper. Though different researchers had proposed different path planning strategies, each plan has its own advantages and disadvantages. The goal of the research work is to develop an algorithm to find out an optimal path from source to destination along with the obstacles. The path planning algorithm not only minimizes the risk of collision but also reduces the planning time and creates a reliable path to reach the desired destination avoiding obstacles. The proposed algorithm is implemented to get the reliable path and compared with that of the existing algorithm to find the optimized path. The new approach is able to minimize the risk of collisions and travelling time with the help of different parameters and simulation software. It is proved through experimental results that the performance of the proposed algorithm is improves considerably and works efficiently when the shape and size of the image changes. It also turns closely at the corners of the obstacles and also reduces the number of steps without affecting the steps and corners. Time and space complexity analysis for this algorithm is experimentally tested and implemented.

Keywords: NFT, Path planning, Time Complexity, Space Complexity, DDA Optimization, Adj*.

(Received October 28th, 2020 / Accepted November 15th, 2020)

1. INTRODUCTION

Path planning of a mobile robot is to determine a collision-free path from a starting point to a goal point optimizing a performance criterion such as distance, time or energy (distance being the most commonly adopted criterion). Based on the availability of information about environment, there are two categories of path planning algorithms, namely off-line and on-line. Path planning of robots in environments where complete information about static obstacles and trajectory of moving obstacles are known in evolutionary approaches of path planning of mobile robots are discussed. Review shows that optimization algorithms are computationally more efficient and hence are increasingly used in tandem with classic approaches [5].

The path planning algorithm contains various methods with different optimization techniques for optimization. The path planning algorithm developed for various platforms depends on the condition whether it is static or dynamic. Mobile robots are expected to work in many places such as factories, offices and so on. Nowadays, autonomous mobile robots are used in the

Presentation + Paper

20 August 2020

Android-based application for shading analysis and assessment of actual solar energy potential

Amit Garg, Prince Sharma, Vivek Verma, Tarunpreet Kaur

Author Affiliations +

Proceedings Volume 11496, New Concepts in Solar and Thermal Radiation Conversion III; 114960G (2020)
https://doi.org/10.1117/12.2570966
Event: SPIE Optical Engineering + Applications, 2020, Online Only

Abstract

The excessive utilisation of conventional energy sources has highlighted a complicated energy crisis due to high dependency and depletion of non-renewable resources; along with the inefficiency to cope up with the pressing requirements of the economy. Shifting to alternative, replenishable forms of energy and developing technology for the same, will fulfil the current energy needs and complement the national security. Solar energy can be productively exercised to meet the current energy requirements. Shading analysis is one of the most critical steps essential to any successful installation of a solar energy system. In photovoltaics, it is important to analyze shading caused by surrounding objects and/or vegetation. In special cases like analysis

KEYWORDS

Open Access | Poster + Paper

21 August 2020

Some fun pedagogical techniques to teach optics to students of all ages

Amit Garg, Prince Sharma, Prahlad Prajapat, Anurag Saxena, Pushkar Pandey, Aman Tyagi, Yash Varshney, Aditi Sharma

Author Affiliations +

Proceedings Volume 11480, Optics Education and Outreach VI; 114800R (2020)

https://doi.org/10.1117/12.2570964

Event: SPIE Optical Engineering + Applications, 2020, Online Only

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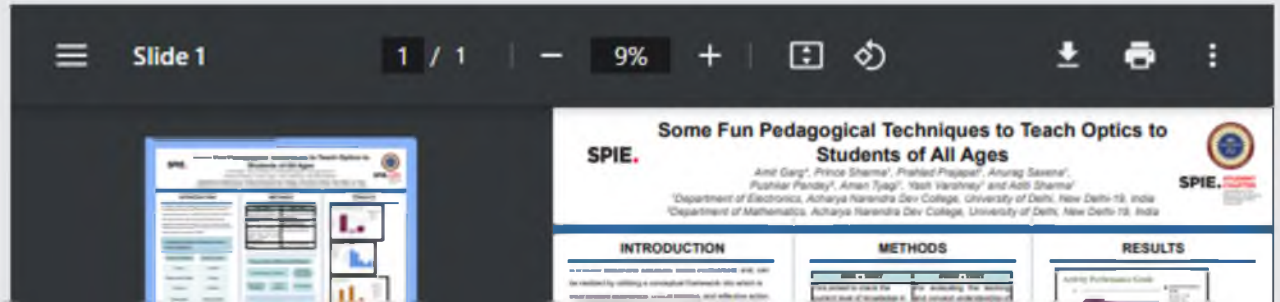
Conference Poster



KEYWORDS

Defence Science Journal, Vol. 70, No. 5, September 2020, pp. 520-528, DOI : 10.14429/dsj.70.14584

Trace Detection of Nerve Agent Simulant in the Fuel Vapour Environment using Metal Oxide/Surface Acoustic Wave E-Nose

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ABSTRACT

Nerve agents are often used at the military warfront, where diesel is a very common interferant. In the present work, a group of surface acoustic wave (SAW) sensors, called E-Nose with dissimilar sensing layers is developed for the recognition of the mixture of diesel and dimethyl methylphosphonate (DMMP) vapors. The exposure of DMMP and diesel vapors is kept at ppb and ppm levels respectively. Varied response patterns of DMMP and diesel vapors were obtained by SAW E-nose. Principal component analysis (PCA) has been used to extract features from the response curves of SAW sensors. Artificial Neural Network pattern recognition has been implemented to identify the precise detection of DMMP vapors in the binary mixture of DMMP and diesel. The effect of pre-processing (using PCA) the raw data before feeding it to artificial neural network is also studied.

Keywords: E-nose; Metal oxide; Sensor

1. INTRODUCTION

Today chemical attack is one of the biggest threats for us. Nerve agents (Sarin, Soman) are the deadliest and widely used class of chemical warfare agents, employed several times during a war[1]. Sensors employed for their detection must take care of the interferants also. Since the accuracy level required in the detection of warfare agents is very high, special technologies are required to minimize the possibility of false alarms. Nerve agents are mostly used at warfronts, where diesel is the major source of interferant. Diesel is used in tanks, trucks, generators, starting compressors for jet engines[2]. Therefore, sensor systems should be capable of detecting nerve agents in the presence of such interferants.

Presently, there exist various sensing techniques like IR deposition, lack of long-term stability, metal oxide sensing layers have also been tried[9-10].

The use of a single sensor is generally not sufficient to detect a particular vapour in a mixture. Hence an E-nose (an array of sensors) is essentially required. The sensing data of E-nose along with suitable pattern recognition technique (PCA, ANN etc.) allows correct recognition of target vapours[11]. In literature, SAW E-nose has been employed for the recognition of various target vapours[12-15]. Joo[13], *et al.* fabricated an array of polymer- coated SAW sensors for the recognition of simulant vapours but individual vapours were tested and the neural network algorithm was not implemented for precise prediction. Matatagui[9], *et al.* implemented Principal Component Analysis and neural network on the SAW response of few simulants,

ELSEVIER

Materials Science and Engineering: B

Volume 258, August 2020, 114577

Green synthesis of TiO_2 nanosheet by chemical method for the removal of Rhodamin B from industrial waste

Rakesh K. Sonker [a b], Gaurav Hitkari [c], S.R. Sabhajeet [d], S. Sikarwar [d], Rahul [e], Sandhya Singh [c]

https://doi.org/10.1016/j.mseb.2020.114577

Abstract

In this research article, the photocatalytic decolourization of rhodamin B by the newly green synthesized TiO_2 nanostructure material has been investigated to consider as effective catalyst for the decontamination of wastewater. The crystal structure and particle size measurement of green synthesized TiO_2 was appraised by X-ray diffraction (XRD). The morphological, structure and particle size distribution was study by SEM and

An overview of factors affecting dengue transmission in Asian region and its predictive models

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PDF

Published Sep 15, 2020

DOI https://doi.org/10.31018/jans.v12i3.2360

Abstract

Among various mosquito-borne diseases, dengue is one of the most prevalent and quickly spreading diseases primarily transmitted by *Aedes aegypti* and *Aedes albopictus*. This review discusses the dengue epidemics in Asian countries with a focus on India and recognizes various climatic, socio-economic, and demographic factors and their complex interaction, involved in dengue expansion. The impact of climatic factors, such as temperature, moisture, and precipitation has been elucidated on the mosquito breeding and disease outbreaks; demonstrating a linear correlation of ambient temperature and humidity with dengue transmission, in contrast with the uncertain association of rainfall. Multifarious empirical models have been developed for estimating the climatic effects on dengue and are used as a baseline to assess the impact on future infections. However, the spatiotemporal distribution of dengue cases can only be predicted best using dynamic modelling

COMPARATIVE LARVICIDAL EFFICACY OF α-CYPERMETHRIN ALONE AND α-CYPERMETHRIN/*CITRUS SINENSIS* PEEL EXTRACT BINARY MIXTURES AGAINST *AEDES AEGYPTI* L.

DEVINA AGGARWAL, ROOPA RANI SAMAL, SARITA KUMAR*

Aedes aegypti is a widely spread disease vector of great concern throughout the world. With continuous rise in cases of Zika, dengue and Chikungunya worldwide, control of *Ae. aegypti* has become a prime concern. The present study investigated the larvicidal effects of individual and various combinations of *Citrus sinensis* hexane peel extract and a synthetic pyrethroid, alpha-cypermethrin against *Ae. aegypti*. Larvicidal bioassays were performed using WHO protocol with minor modifications. The investigated compounds were found effective individually as well in binary mixtures indicating the efficient synergism. Hexane extract of *Citrus sinensis* peels assayed against *Aedes aegypti* larvae resulted in LC_{50} of 46.53 ppm after exposure for 24 h, while alpha-cypermethrin treatment resulted in LC_{50} value of 0.0063 ppm. The binary mixtures of both the compounds in 1:1, 1:5 and 1:10 ratios also showed significant larvicidal potential. The 1:1 mixture was found most effective with co-toxicity coefficient and synergistic factor as 23.456 and 3.865, respectively, for the LC_{50} at 24h. The binary mixtures showed synergism as well as additive effects in all the ratios tested except 1:5 ratio for LC_{90} at 48h which showed inconsequential antagonistic effect. Results showed decreased synergistic effects with increase in the citrus extract proportion in the binary mixtures. We suggest that phytoextract/cypermethrin mixtures can be more operative than insecticide/phytoextract alone, and can be used as a good ecofriendly approach in vector control programs. Such mixtures could reduce the costs, reduce insecticide dose, and regulate insecticide resistance as part of integrated vector management.

Keywords: *Citrus sinensis*, *Aedes aegypti*, synergism, additive, antagonism, binary mixtures.

INTRODUCTION

Mosquito-borne diseases are the major cause of concern worldwide, especially in tropical countries. Different mosquito vectors, *Aedes, Culex* and *Anopheles* transmit a range of disease pathogens causing dengue, Chikungunya, malaria, filariasis and Zika, etc. Though, different species of mosquitoes are playing havoc at global level, yet since last decade, outbreak of *Aedes*-borne diseases has taken a

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Acta Ecologica Sinica

Volume 42, Issue 3, June 2022, Pages 156-161

Reduced physiological and reproductive fitness induced by *Nerium oleander* leaf extracts in the cotton bollworm, *Helicoverpa armigera* (Lepidoptera: Noctuidae)

Aadhya Sivakumar [a], Monika Mishra [b], Vinay Singh Dagar [b], Sarita Kumar [b]

https://doi.org/10.1016/j.chnaes.2020.12.002

Abstract

Helicoverpa armigera is one of the most devastating, cosmopolitan, polyphagous and multivoltine pests of agricultural crops. The growing side-effects of synthetic insecticides used to control agricultural pests, have amplified demand for the relatively safe and biodegradable compounds which offer benefits over synthetic chemical insecticides. Hence, the current study investigates the effects of Nerium oleander methanol leaf

Original Paper | Published: 21 October 2020

Protection of surplus food from fungal spoilage using *Streptomyces* spp.: a green approach

Munendra Kumar, Prateek Kumar, Payal Das, Renu Solanki & Monisha Khanna Kapur

Archives of Microbiology **203**, 941–950 (2021) | Cite this article

403 Accesses | **2** Citations | Metrics

Abstract

Consortia of *Streptomyces* spp. (colonies 169, 194, 165 and 130) used in this study are an efficient producer of secondary metabolites like chitinases and antifungal compounds, which may help in the protection of surplus food from spoilage. Qualitative screening for chitinase production and taxonomy of these colonies were undertaken in our previous studies. In the current study, GC–MS analysis of extract produced from the consortia of *Streptomyces* strains was done for the identification of antifungal compounds. Treatment of surplus food with activated consortia of *Streptomyces* spp. has protected powdered food for a month, whereas fresh food (unpowdered) was preserved for two days. A control sample of surplus food (untreated) was kept to check the contamination, which resulted in the growth of three fungi

Original Article | Published: 04 September 2020

Draft genome and secondary metabolite biosynthetic gene clusters of *Streptomyces* sp. strain 196

Prateek Kumar, Anjali Chauhan, Munendra Kumar, Bijoy K. Kuanr, Renu Solanki & Monisha Khanna Kapur

Molecular Biology Reports **47**, 6741–6747 (2020) | Cite this article

743 Accesses | **1** Citations | **3** Altmetric | Metrics

Abstract

Emergence of MDR 'superbugs' inflamed a severe sense of urgency amongst scientists aiming at the discovery of novel potential drug molecules. Bacteria of the genus *Streptomyces* are really worth investigating for their immense potential to produce natural compounds of pharmaceutical importance. In the present study, the genome of *Streptomyces* sp. strain 196 was sequenced, studied and secondary metabolite biosynthetic gene clusters (smBGCs) were detected. FAME analysis was used for taxonomic validation of strain 196. Genome of strain 196 was sequenced using the Illumina NextSeq system which has resulted in a draft genome of 7.4 Mb. Rapid annotation using subsystem technology (RAST) results revealed the presence of

Published: 28 August 2020

Indicators for assessment of soil quality: a mini-review

Swati Maurya, Jeeva Susan Abraham, Sripoorna Somasundaram, Ravi Toteja, Renu Gupta & Seema Makhija

Environmental Monitoring and Assessment **192**, Article number: 604 (2020) | Cite this article

Abstract

Soil quality is the competence of soil to perform necessary functions that are able to maintain animal and plant productivity of the soil. Soil consists of various physical, chemical, and biological parameters, and all these parameters are involved in the critical functioning of soil. There is a need for continuous assessment of soil quality as soil is a complex and dynamic constituent of Earth's biosphere that is continuously changing by natural and anthropogenic disturbances. Any perturbations in the soil cause disturbances in the physical (soil texture, bulk density, etc.), chemical (pH, salinity, organic carbon, etc.), and biological (microbes and enzymes) parameters. These physical, chemical, and biological parameters can serve as indicators for soil quality assessment. However, soil quality assessment cannot be possible by

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Journal of Molecular Structure

Volume 1199, 5 January 2020, 127003

Ibuprofen-based chemosensor for efficient binding and sensing of Cu^{2+} ion in aqueous medium

Shyam Lal [a], Kunal Prakash [b], Sunita Hooda [a], Vikrant Kumar [a], Pramod Kumar [c]

Show more

https://doi.org/10.1016/j.molstruc.2019.127003

Abstract

An ibuprofen based molecular receptor **R1** (N-[2-[(2-Hydroxy-benzylidene)-amino]-ethyl]-2-(4-isobutyl-phenyl)-propionamide) was developed for the detection of Cu^{2+} ion in aqueous medium by absorbance and fluorescence techniques. Binding constants ($4.89–5.67 \times 10^3\ M^{-1}$) and detection limits (1.71–2.12 μM) showed significant sensing ability. SEM and PXRD techniques were employed to establish the complex formation between **R1** and Cu^{2+} ion and also showed promising behaviour of nanomaterial. The

Fabrication of a Gold-Supported NiAlTi-Layered Double Hydroxide Nanocatalyst for Organic Transformations

Garima Rathee, Sahil Kohli, Sagar Panchal, Nidhi Singh, Amardeep Awasthi, Snigdha Singh, Aarushi Singh, Sunita Hooda*, and Ramesh Chandra*

Cite this: *ACS Omega* 2020, 5, 37, 23967−23974
Publication Date: September 14, 2020
https://doi.org/10.1021/acsomega.0c03250

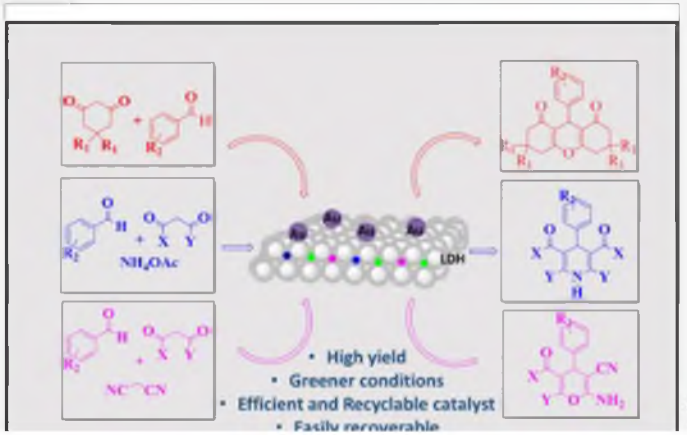
ACS Omega

PDF (3 MB) SI Supporting Info (1) »

SUBJECTS: Catalysts, Catalytic reactions, Ethanol, Inorganic compounds, Reaction products

Abstract

This work is mainly focused on the synthesis of an efficient and reusable heterogeneous Au/NiAlTi layered double hydroxide (LDH) nanocatalyst and its applications in the preparation of biologically important xanthene, 1,4-dihydropyridine, polyhydroquinoline, and 4*H*-pyran derivatives. NiAlTi LDH was designed hydrothermally and then gold was supported over the surface of LDH by using ion-exchange and $NaBH_4$ reduction methods. The synthesized nanocatalyst was physicochemically characterized by X-ray diffractrometry, Fourier-transform infrared spectroscopy, thermogravimetric analysis, scanning electron microscopy, and transmission electron microscopy (TEM). The TEM images confirmed the support of gold nanoparticles over the surface of LDH with a size distribution of 7−9 nm. The well-characterized nanocatalyst was tested for the synthesis of biologically important xanthene, 1,4-dihydropyridine, polyhydroquinoline, and 4*H*-pyran derivatives. The advantages obtained were excellent yields in a lesser reaction time. Stability and reusability were also accessed; the catalyst was stable even after five cycles. High catalytic efficiency, easy fabrication, and recycling ability of Au/NiAlTi LDH make it a potential catalyst for the synthesis of xanthene, 1,4-dihydropyridine, polyhydroquinoline, and 4*H*-pyran derivatives.



Natural Polysaccharide Based Graphene Oxide Nanocomposites for Removal of Dyes from Wastewater: A Review

Laishram Saya, Drashya Gautam, Vipin Malik, W. Rameshwor Singh, and Sunita Hooda*

Cite this: *J. Chem. Eng. Data* 2021, 66, 1, 11−37
Publication Date: November 9, 2020
https://doi.org/10.1021/acs.jced.0c00743

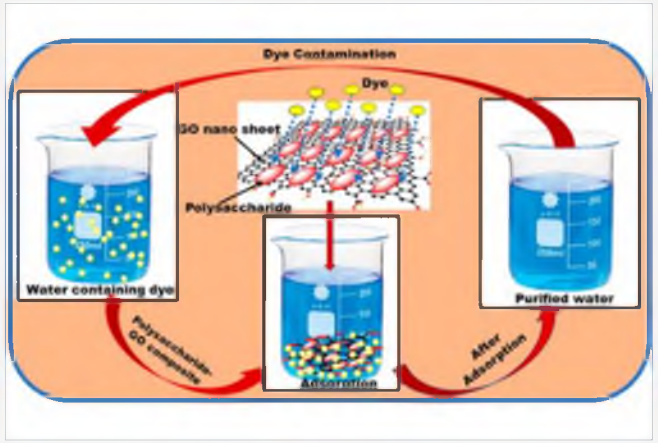
Journal of Chemical & Engineering Data

Read Online | PDF (10 MB)

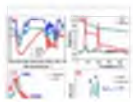
SUBJECTS: Adsorption, Carbohydrates, Dyes and pigments, Oxides, Two dimensional materials

Abstract

This article discusses the potential applications of natural polysaccharide-based graphene oxide nanomaterials in the field of wastewater remediation through the removal of organic and synthetic dyes. Being highly toxic, carcinogenic, and nonbiodegradable, dyes disposed from textile, paper, and printing industries etc. pose a serious threat to various life forms on earth. Recently, there has been an increased interest in the amalgamation of biopolymers, such as polysaccharides, with the high adsorption efficiency of graphene oxide. Polysaccharides, apart from being nontoxic, low cost, and eco-friendly, possess a variety of functional groups enabling them to be easily tuned for the desired applications. When grafted with GO nanosheets, they give rise to unique nanomaterials possessing diverse applications, especially in the eradication of harmful contaminants from wastewater. This review is an attempt to give consolidated and detailed information on different aspects of the adsorption behavior of various potentially low-cost polysaccharide-based GO nanoadsorbents toward lethal dyes. The characterization techniques used, adsorption isotherms, kinetics, thermodynamic behavior, recyclability, and swelling properties as well as the adsorption mechanism have been outlined in this article. The whole anthology of literature reports excellent dye removal efficiency with significant regeneration performance making these nanoadsorbents promising candidates for practical







Journal of King Saud University - Science
Volume 32, Issue 8, December 2020, Pages 3351-3358

Original article

Self-nitrogen doped carbons aerogel derived from waste cigarette butts (cellulose acetate) for the adsorption of BPA: Kinetics and adsorption mechanisms

Norah S. Alhokbany [a], Mu Naushad [a b], Vikrant Kumar [c], Saad Al hatim [a], Saad M. Alshehri [a], Tansir Ahamad [a]

Show more

https://doi.org/10.1016/j.jksus.2020.09.021

Abstract

The fabrication of highly porous functionalized carbon materials is the demand of current scenario for the removal of toxic pollutants form aqueous solution. Therefore,

Open Access Article

Design and Synthesis of Various 5′-Deoxy-5′-(4-Substituted-1,2,3-Triazol-1-yl)-Uridine Analogues as Inhibitors of *Mycobacterium tuberculosis* Mur Ligases

by Vincent Hervin [1], Ritu Arora [2], Jyoti Rani [2,3], Srinivasan Ramchandran [3], Urmi Bajpai [2], Luigi A. Agrofoglio [1,*] and Vincent Roy [1,*]

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Molecules **2020**, *25*(21), 4953; **https://doi.org/10.3390/molecules25214953**

Received: 14 September 2020 / Revised: 17 October 2020 / Accepted: 19 October 2020 / Published: 26 October 2020

(This article belongs to the Special Issue **Nucleosides – Nucleotides – Oligonucleotides**)

Abstract

The synthesis of hitherto unknown 5′-deoxy-5′-(4-substituted-1,2,3-triazol-1-yl)-uridine and its evaluation, through an one-pot screening assay, against MurA-F enzymes involved in *Mycobacterium tuberculosis* (Mtb), are described. Starting from UDP-*N*-acetylmuramic acid (UDP-MurNAc), the natural substrate involved in the peptidoglycan biosynthesis, our strategy was to substitute the diphosphate group of UDP-MurNAc by a 1,2,3-triazolo spacer under copper-catalyzed azide-alkyne cycloaddition conditions. The structure-activity relationship was discussed and among the 23 novel compounds developed, *N*-acetylglucosamine analogues **11c** and **11e** emerged as the best inhibitors against the Mtb MurA-F enzymes reconstruction pathway with an inhibitory effect of 56% and 50%, respectively, at 100 µM. Both compounds are selective inhibitors of Mtb MurE, the molecular docking and molecular dynamic simulation suggesting that **11c** and **11e** are occupying the active site of Mtb MurE ligase.

Keywords: Mur ligase; nucleoside analogues; copper-catalyzed azide-alkyne cycloaddition; antibacterial

NEEM FLOWERS (*AZADIRACHTA INDICA*) AS AN ABUNDANT SOURCE OF NECTAR FOR BUTTERFLIES IN AN URBAN LANDSCAPE IN DELHI, INDIA

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rajeshchaudhary@andc.du.ac.in

Reviewer: Peter Smetacek

Abstract

Most butterflies feed on floral nectar. The ability of butterflies to access nectar deep within a flower depends on the length of their proboscis. Adequate nutrition is known to maintain the reproductive potential of butterflies. In an urban context, lacking adequate parks and gardens, there is always a need of flowers that can provide nectar to butterflies. In this situation, avenue trees, bearing flowers with nectar accessible to a wide range of butterflies, could help maintain a reasonably diverse butterfly population. The Neem tree, *Azadirachta indica*, is planted along roads and in parks in urban areas of Delhi. Its small flowers were found to attract several species of butterflies belonging to all five major families present in Delhi. It is suggested that trees such as *Azadirachta indica* and other nectar trees, if planted as avenue trees, may help in the conservation of butterflies in an urban landscape.

Key words: Flowering tree, Food plant, Butterfly, Urban Landscape

Introduction

Butterflies are liquid-feeding insects; they acquire food by sucking through their long tubular proboscis (Krenn, 2010). Adult butterflies can be broadly categorised into two feeding guilds: nectar feeding (feeding on floral nectar) and non-nectar feeding (acquiring nutrition from decaying fruit, sap, honey dew, etc.). The feeding habits are associated with certain modifications in the microstructure of the proboscis, particularly at the tip (Krenn *et al*., 2001, Molleman *et al*., 2005; Krenn, 2010; Lehnert, *et al*., 2016). A vast majority of butterflies feed on floral nectar (Krenn, 2010). The profitability of feeding on floral nectar depends in part on the depth of the corolla-tube (or the depth at which nectar is seated in flowers); the amount of nectar, proboscis length and wing load (Corbet, 2000; Tiple *et al*., 2009). The shorter proboscis of small butterflies limits them from using flowers with deep seated nectar (May, 1992). Butterflies with a longer proboscis however, can harvest nectar from a broad range of flowers, including flowers with short as well as those with long corolla tubes (May, 1992; Corbet, 2000; Kunte, 2007; Sultana *et al*., 2017). Nutrition is known to maintain high fecundity in female butterflies and increase their body weight and fat storage (Hill *et al*., 1989; O'Brien *et al*., 2004; Mevi-Schutz *et al*., 2005; Geister *et al*., 2008; Karlsson *et al*., 2009). Butterflies obtain nectar from a range of flowers. The role of tree flowers as a source of nectar has not been appreciated by many researchers. Tree flowers however, can be an important source of nectar for butterflies living in or close to forested as well as urban landscapes. Here, I present an account of butterfly species which can benefit from feeding on the flowers of *Azadirachta indica* (A. Juss; Family: Meliaceae) commonly known as 'Neem tree'. The tree commonly grows in urban and rural areas in most parts of India and a few researchers have indicated

A COMPREHENSIVE CHECKLIST OF BUTTERFLIES SEEN IN CORBETT TIGER RESERVE, UTTARAKHAND, INDIA

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Reviewer: Peter Smetacek

Abstract

Corbett Tiger Reserve (CTR) conserves a wealth of flora and fauna and is a known destination for ecotourism in Northern India. Besides mammals and birds, for which CTR is known to many, frequent visits to CTR and its vicinity for watching butterflies are also on the rise in recent times. In this respect, an account of species of butterflies in the CTR and its vicinity would be useful not only for butterfly ecotourism but also for conservational, educational and scientific purposes. By virtue of photographic documentation of species of butterflies in CTR for over a decade, we provide here a list of butterflies seen in various tourist zones of CTR and its immediate vicinity. We recorded 94 genera and 130 species belonging to six families. On the basis of our records and work by others in CTR, a comprehensive checklist of 143 species of butterflies has been compiled.

Introduction

Corbett Tiger Reserve (CTR) is one of the key biodiversity areas in the foothills of Himalaya in Northern India. Established as a wildlife sanctuary with a total area of few hundred square kilometres in 1934, it was upgraded to a National Park in 1936 (Khanna *et al*., 2008). Presently, the CTR has a well-protected expanse of 1288.31 km² (NTCA, 2009). The spread of CTR encompasses a variety of habitats that support diverse flora and fauna (Pant, 1986, Editor-Director, 2008, Khan *et al*., 2008). Besides conserving wilderness, the location and approachability of CTR; and plentiful wildlife attracts lakhs of tourists every year (Badola *et al*., 2010; Gusain, 2015). The recreational value of CTR generates livelihood for the local community (Badola *et al*. 2010; Kumar *et al*., 2019).

Today, butterfly watching is one of the favourite recreational activities for many, and the trend is gradually on the rise. This makes butterflies important from the perspective of ecotourism; defined here as "low impact nature tourism which contributes to the maintenance of species and habitats either directly through a contribution to conservation and/or indirectly by providing revenue to the local community sufficient for local people to value, and therefore protect, their wildlife heritage area as a source of income" (Fennel, 2015; Kumianto *et al*., 2016; Singh *et al*., 2016). The diverse and pristine habitat of CTR is expected to be rich in the diversity of butterflies. However, literature on butterfly diversity in and around CTR is sparse. Only two reports provide an account of species of butterflies found in CTR (Kumar, 2008; Arya *et al*., 2020). The number of species of butterflies mentioned in these reports are 36 (Kumar, 2008), and 56 (Arya *et al*., 2020). The present communication reports 130 species of butterflies based on the observations made

OVIPOSITION BY *JAMIDES BOCHUS* (STOLL, [1782]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN NEW DELHI, INDIA

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Reviewer: Peter Smetacek

Several individuals of the Dark Cerulean (*Jamides bochus*) were sighted 3-4 times daily between 30. viii.2020 to 20.ix.2020, fluttering over the crown of *Millettia pinnata* (L.) Panigrahi (Fabaceae). On two occasions, more than two individuals were sighted at a time. On 22.ix.2020, a female *J. bochus* was observed laying eggs on nascent buds and leaves of *M. pinnata*, in the Rohini area of New Delhi. It was observed for 5 minutes from a distance of 2.5-3 m and the events were photographed (Figures 1). The butterfly returned twice to the same spot to lay eggs after fluttering for about 1 minute in the vicinity of the twig, where it had laid the first batch of eggs.

M. pinnata is a medium sized tree planted commonly alongside many roads in Delhi. Sightings of *Jamides bochus* in Delhi are rare. However, during the past few years it has been sighted several times. It was so far not known to breed in Delhi (Chaudhary *et. al.*, 2019, Dr. Surya Prakash, *pers. comm.*). The present observation provides supporting evidence towards the assertion by Chaudhary & Kumar (2019) that the records of the *J. bochus* in Delhi are of a breeding population rather than of migrants.

Reference

Chaudhary, R. & V. Kumar. 2019. Sightings of *Jamides bochus* (Stoll, [1782]) and *Prosotas nora* (C. Felder, 1860) (insecta: Lepidoptera: Lycaenidae) from urbanized parts of New Delhi. *Bionotes* 21 (1): 3-4.

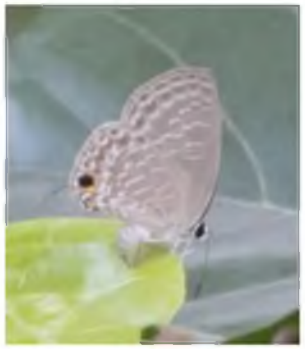

Fig.1 & 2: Oviposition by *Jamides bochus* on nascent buds and leaf of *Millettia pinnata* in Delhi.

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Gene Reports

Volume 20, September 2020, 100759

Diabetes: Perspective and challenges in modern era

Yamini Goyal [a 1], Amit Kumar Verma [a 1], Deepti Bhatt [a], Arshad Hussain Rahmani [b], Yasheshwar [c], Kapil Dev [a]

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Abstract

Prevalence of diabetes is increasing rapidly due to change in lifestyle and modernization. Other than genetic and lifestyle factors, research has been concentrated in recognizing the effect of in utero conditions and mechanisms of epigenetics in developing diabetes. It emphasizes the need of discovering new methods of prevention focusing on child and maternal health. The Diabetes prevalence is more in developing nations than developed nations. In modern era with the globalization diabetes is a major reason of medical care expenditure and mortality and it is one of the biggest health challenges of current and

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Applications and Applied
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Vertical Motion of the Variable Infinitesimal Mass In the Circular Sitnikov Problem

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Received: May 12, 2020; Accepted: September 18, 2020

Abstract

The circular case of Sitnikov problem is studied here when the infinitesimal body varies its mass according to Jeans law and it is moving along the z-axis which is perpendicular to the orbital plane of the two equal spherical primaries. The two primaries are moving in $xy-$plane on the same circular path. These two primaries are imposing the Newtonian forces on the third variable mass body but not influenced by it. Stability of equilibrium points is examined followed by the derived equations of motion. The time-series solutions of the equation of motion are performed by using the Lindstedt-Poincaré method which is used to remove the secular term. We have numerically performed the time-series which shows that variation parameters have great impact on it.

Keywords: Circular Sitnikov problem; Variable mass; Meshcherskii transformation; Lindstedt-Poincaré method

MSC 2010 No.: 70F15, 70K42, 70F07

Published: 10 September 2020

Generalized Elliptic Restricted Four-Body Problem with Variable Mass

Abdullah A. Ansari & Sada Nand Prasad

Astronomy Letters **46**, 275–288 (2020) | Cite this article

169 Accesses | **18** Citations | Metrics

Abstract

The elliptic case of restricted four-body problem with variable mass of infinitesimal body is studied here. The three primary bodies which are placed at the vertices of an equilateral triangle and moving in the elliptical orbits around their common center of mass. Out of these primaries we have considered that one massive body is having radiating effect and other two bodies are oblate in shapes. The fourth body which have infinitesimal mass, are varying its mass according to Jeans law. We derive the equations of motion of the infinitesimal body under the generalized sense in the elliptic restricted four-body problem by using the Meshcherskii-space time transformations. Further we numerically study about the equilibrium points, Poincaré surfaces of section, regions of possible motion and basins of the

THE MOTION PROPERTIES OF THE VARIABLE MASS PLANETOID IN THE ELLIPTICAL SITNIKOV PROBLEM

Abdullah A. Ansari[1,*], Laxmi Narain[2] and Sada Nand Prasad[2]

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July 25, 2020

Abstract

The aim of the study is to investigate the effect of variation parameters due to variable mass of the planetoid in the elliptical Sitnikov problem. Where both primaries are moving in elliptical orbits and imposing the gravitational forces on the third infinitesimal body which varies its mass according to Jeans law and it does not affect the motion of the primaries. Planetoid is moving along perpendicular line (z-axis) to the orbital plane of the primaries. We derive the equation of motion of the planetoid followed by the hamiltonian of the system. Then we solve the equation of motion of the Hill's type equation. And again the time-series solution to the equation with nonlinear force is determined using first the Courant and Snyder transformation followed by the Lindstedt–Poincaré perturbation method which is used to remove the secular term and then an application of Courant and Snyder transformation is used. We have numerically performed the time-series which shows that variation parameters have great impact on it. We also compare our results with the existing results and found significant role of the variation parameters used.

Keywords: Elliptical Sitnikov problem, Variable mass, Jeans law, Courant and Snyder transformation.

1 Introduction

Sitnikov configuration is an interesting problem which starts over decades by K. A. Sitnikov in 1960. This configuration of restricted problem has primaries which are moving either in elliptic or circular path in the same plane while third body is moving on the vertical straight line of the plane of the motion of the primaries. These

Soft Computing: Theories and Applications pp 107–113 | Cite as

EPQ Model with Product Stewardship Approach

Pratiksha Saxena, Chaman Singh & Kamna Sharma

Conference paper | First Online: 25 November 2017

1155 Accesses | 1 Citations

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 583)

Abstract

From the past few decades, most of the researchers concentrate on recycling of consumer goods to reduce the impact on environment and health, but now it is time to change our basic approach. In this research paper, we elaborate a nascent issue of product stewardship. Economic production model (EPQ) is a production model in which production occur in a time cycle to fulfill the demand. The proposed model we consider a basic EPQ model with all basic

Indian Journal of Science and Technology

DOI: 10.17485/IJST/v13i37.290

Year: 2020, Volume: 13, Issue: 37, Pages: 3850-3870

Original Article

Green design and product stewardship approach for two-warehouse inventory model

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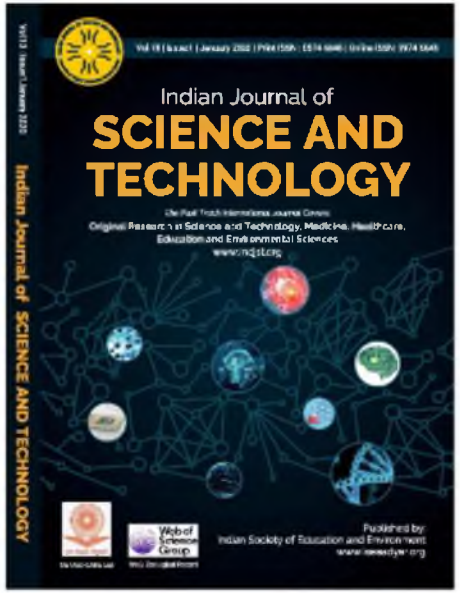

Year: 2020, Volume: 13, Issue: 37

ABSTRACT

Background/Objectives: To trim down the recycling cost of any manufactured goods with the help of green design and product stewardship. **Methods/Statistical analysis:** For the planned EPQ (economic production quantity model) model, all costs are calculated to find total cost and this total cost is optimized with the help of the Hessian matrix. Sensitivity analysis is also carried w.r.t. different parameters, to illustrate the impact of these parameters on the proposed model. The convexity of the total cost function is also checked with the help of mathematical software Mathematica 9.0. **Findings:** Major finding of the proposed model are as follows: (i) Increase in the number of recycles results in the reduction of the total cost. (ii) Product stewardship parameter has a negative effect on total cost as the PS increases from 1 to 4 units, total cost decreases from 5926.00 to 5918.96 units (see Table 9) (similar findings can be written for numeric example 1 after correcting it). (iii) Green design costs have a positive effect on total cost, as the green design cost

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Vol. 16, Issue 2 (December 2021), pp. 1120 – 1129

Generalized cr3b Problem with Heterogeneous Primary and Secondary as Finite Straight Segment

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Abstract

The existence and stability of stationary points are investigated under the effects of heterogeneous primary having N-layers with different densities, radiating finite straight segment and the Coriolis as well as centrifugal forces in the frame of cr3bp. The equations of motion are determined with the help of which we evaluate five stationary points analytically as well as graphically, and examine their stability.

Keywords: Restricted three-body problem; Heterogeneous body; Finite straight segment; Radiation pressure; Stationary points

MSC 2010 No.: 70F15, 70F07, 70F05

Outline

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European Journal of Pharmacology

Volume 890, 5 January 2021, 173741

Review

A comprehensive review on potential therapeutics interventions for COVID-19

Heerak Chugh [a 1], Amardeep Awasthi [a 1], Yashi Agarwal [a], Rajesh K. Gaur [c], Gagan Dhawan [d], Ramesh Chandra [a b]

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Abstract

COVID-19 is an infectious respiratory disease caused by SARS-CoV-2, a new beta coronavirus that emerged in Wuhan, China. Being primarily a respiratory disease, it is highly transmissible through both direct and indirect contacts. It displays a range of symptoms in different individuals and thus has been grouped into mild, moderate, and severe diseases. The virus utilizes spike proteins present on its surface to recognize ACE-2 receptors present on the host cells to enter the cell cytoplasm and replicate. The viral invasion of cells induces damage response, pyroptosis, infiltration of immune cells, expression of pro-inflammatory cytokines (cytokine storm), and activation of the adaptive immune system. Depending on viral load and host factors like age and underlying medical conditions, the immune responses mounted against SARS-CoV-2 may cause acute respiratory distress syndrome (ARDS), multiple organ failure, and death. In

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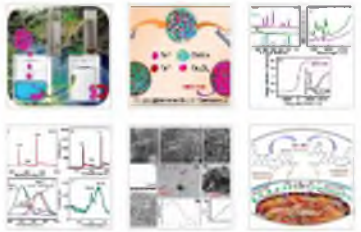

Environmental Advances

Volume 2, December 2020, 100014

Fe_3O_4 loaded chitin – A promising nano adsorbent for Reactive Blue 13 dye

Drashya Gautam [a], Laishram Saya [b], Sunita Hooda [a]

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https://doi.org/10.1016/j.envadv.2020.100014

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Erratum regarding missing Declaration of Competing Interest statements in previously published articles

Environmental Advances, Volume 7, April 2022, Pages 100139

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Abstract

Herein we report the development of easily separable, Fe_3O_4 loaded chitin nanomaterial (MCH NM) via simple Co-precipitation route, as a promising adsorbent for removal of Reactive Blue 13 (RB13) dye from aqueous solution in visible light ($\lambda \geq 420$nm). This nanomaterial was characterized using distinctive physicochemical techniques; MCH NM show band gap energy of 2.257eV, evaluated by Tauc's plot using UV–visible spectroscopy. MCH NM show excellent swelling property due to the tendency of the polymer chains to reach elongated configurations at equilibrium beyond which an elastic

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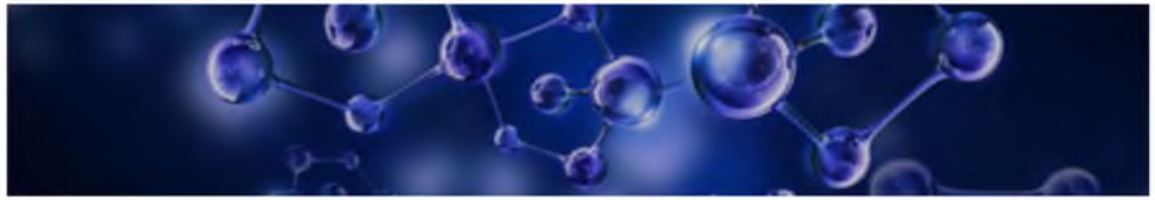

Synthesis of Silver Nanoparticles by *Phyllanthus emblica* Plant Extract and Their Antibacterial Activity

Rajesh Kumar Meena[1*], Risikesh Meena[2], Dinesh Kumar Arya[3], Sapana Jadoun[4], Renu Hada[5] and Roopa Kumari[6]

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IJSTA

International Journal of Scientific and Technical Advancements

ISSN: 2454-1532

Artificial Intelligence Assisted Smart Mirror

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Abstract— According to a survey [1] and research carried out by Today Show and AOL [2], the average person spends 55-56 minutes every day in front of the mirror. In today's fast-moving world, there is a need to manage time very efficiently while being healthy and content in one's life. Considering these observations, this paper constitutes the demonstration and creation of a project aiming to utilize every minute spent in front of a mirror in things like keeping track of mental health and making the best use of smart emerging technologies. In the proposed project idea, this paper presents another interactive smart mirror with some technological capabilities like emotion tracking, voice-activated talking bot with personal assistance, face recognition, the door unlocks, controlling lights, fans, and much more. The proposed mirror also displays day to day schedule, reminders, meetings and engagements fetching all of the required information from the user's Google account and real-time information such as live weather updates, local time, and latest headlines. Moreover, it keeps on displaying positive messages, compliments one's outfit, and greetings depending on what time it is.

Keywords— Smart Mirror, Raspberry PI, Artificial Intelligence, node.js, Python, JavaScript, Two-way mirror

I. INTRODUCTION

It is said that every second count and the saying is considered to be among the best of letter and spirit. There is rarely a home on earth without a mirror. Normally, a majority of people spend almost half of an hour in front of a mirror on a daily basis. With the advancement in technology the mirror should also adapt to move towards many emerging technologies like smartphones, tablets and laptops. The proposed solution to the problem is to turn the mirror into a Smart Electronic device like Alexa, Google Assistant.

Taking advantage of AI technology it is embedded in it to make smart and usable in all technological aspects. The most important goals of the Smart Mirror are to save the user's time and consequently, help in being more productive and also to allow receive all the updates on a timely basis. A smart mirror also reduces the great haste of completing morning routines by

II. RELATED WORK

The proposed smart mirror facilitates access to personalized services such as assistance, emotion tracking, face recognized door unlocks, retrieval of important engagements and notifications from user's Google account, real-time weather updates, and news headlines. Even while functioning as an ordinary mirror, it complements the user's outfit and greets concerning the time.

Some of the previous works in this field are written briefly in this section.

1. A system [1] that lets users control the household smart appliances and provide access to personalized services; ensuring comfort in accessing these services without requiring any human intervention
2. Mirror [2] embedded with additional functionality to display personalized updates and news and provide personal assistance as well. This mirror seeks the user's

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Journal of Alloys and Compounds

Volume 830, 25 July 2020, 154641

Enhancement in NH_3 sensing performance of ZnO thin-film via gamma-irradiation

Maqsood R. Waikar [a], Pooja M. Raste [a], Rakesh K. Sonker [b], Vinay Gupta [b], Monika Tomar [c], Mahendra D. Shirsat [d], Rajendra G. Sonkawade [a]

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https://doi.org/10.1016/j.jallcom.2020.154641

Abstract

In this work, chemically synthesized Zinc Oxide (ZnO) thin films were exposed to Cobalt-60 (Co-60), 1.25 MeV average energy of gamma source at different doses for possible augmentation in NH_3 sensing. The hexagonal crystalline structure was confirmed by XRD spectra and an enhancement in crystallite size was observed with an increase in radiation followed by decrease at 50 kGy dose. The FTIR spectra showed there were no significant changes in the peak position after gamma-irradiation. The morphological investigation showed the maturation of 1D ZnO hexagonal nanorods over the surface of the film. However, after gamma-irradiation, the ZnO nanorods were found connected, forming bunches. The band-gap increased for 50 kGy doses as compared to pristine ZnO thin film. However, characterization result analysis showed that gamma-irradiation produced conspicuous improvements in chemically prepared ZnO microstructure. It was found that post-irradiated (at 20 kGy) ZnO thin film sensor achieved 7.20 as response

Outline

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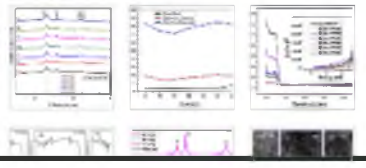

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Materials Science in Semiconductor Processing

Volume 110, May 2020, 104975

Post-γ -irradiation effects on structural, optical and morphological properties of chemical vapour deposited MWCNTs

Maqsood R. Waikar [a], Rakesh K. Sonker [b], Sakshi Gupta [c], Shiv Kumar Chakarvarti [d], Rajendra G. Sonkawade [a]

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Highlights

- The crystallite size increases with increasing γ dose at 60 kGy as compared to pristine MWCNTs.
- Bandgap and structural parameters d, ε, δ and g decreases with increasing γ dose as compared to pristine MWCNTs.
- FTIR spectra peak shifted after γ irradiation is the evidence of changes in the structure of the MWCNTs.
- Raman spectra show the structural ordering at high dose (60 kGy) of MWCNTs.

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RESEARCH PAPER

Received: 24/01/2020 Revised: 28/03/2020 Accepted: 29/03/2020

Chemistry and Pharmacology of Miraculous *Echinacea purpurea* L.

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Department of Chemistry, University of Rajasthan, Jaipur, Rajasthan, India
*Department of Chemistry, Acharya Narendra Dev College, Delhi, India
**Department of Chemistry, SBRM Govt. P.G. College, Nagaur, Rajasthan, India

ABSTRACT

Echinacea purpurea L. (EP) is one of the most important perennial medical herbs with enormous pharmacological and aesthetic properties. Mainly Echinacea is focused on its immunomodulatory effects, anti-inflammatory, antimicrobial, antiviral, antifungal and urinary tract infections. Other aspects of its beneficial effects viz. antioxidant, antibacterial, antiviral, and larvicidal activities antianxiety, antidepression, cytotoxicity, and antimutagenicity as induced by the plant have been revealed in various studies. The chemistry and its pharmacological actions are well documented. Several groups of

Advances in Zoology and Botany 8(1): 12-19, 2020
DOI: 10.13189/azb.2020.080103
http://www.hrpub.org

Optimizing Synthesis of *Citrus limetta* Peel Silver Nanocomposites Possessing Larvicidal Potential against Dengue Vector, *Aedes aegypti* L.

Devina Aggarwal[1], Aarti Sharma[2], Sarita Kumar[3,*]

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Received October 13, 2019; Revised November 25, 2019; Accepted December 4, 2019

Abstract *Aedes aegypti* L. is the major vector accountable for the spread of several diseases of medical importance. The control strategies primarily relying on chemical insecticides have caused negative impact on our environment and human health. Thus, current study employed *Citrus limetta* peel extracts (CLPE) against larvae of *Ae. aegypti*. Silver nanocomposites (AgNCs) from CLPE were synthesised and the process of synthesis was optimized by varying temperature; volume and concentration of silver nitrate solution; and the volume of catalyst. A conspicuous change in colour of the reaction mixture was noticed from pale yellow to dark brown. This diseases; like Yellow fever, Zika, Dengue fever and Chikungunya; has captivated attention of researchers, health organizations and vector control bodies. In the last few decades, the prevalence of *Aedes*-borne diseases; especially dengue; has augmented extensively at global level. According to World Health Organization, almost half of the world's population (3.9 billion) residing in 128 countries is prone to the dengue infection while more than 100 countries are endemic to dengue [1]. According to Union Health Ministry of India, the infections and fatalities caused by dengue virus are rising in India year by year raising serious concerns about the vector control.

Article | Open Access | Published: 06 May 2021

pH induced conformational alteration in human peroxiredoxin 6 might be responsible for its resistance against lysosomal pH or high temperature

Rimpy Kaur Chowhan, Sunaina Hotumalani, Hamidur Rahaman & Laishram Rajendrakumar Singh

Scientific Reports **11**, Article number: 9657 (2021) | Cite this article

Abstract

Peroxiredoxin 6 (Prdx6), the ubiquitously expressed enzyme belonging to the family of peroxidases, namely, peroxiredoxins, exhibits a unique feature of functional compartmentalization within cells. Whereas, the enzyme localized in cytosol shows glutathione peroxidase activity, its lysosomal counterpart performs calcium independent phospholipase A2 (aiPLA2) activity. Like any true moonlighting protein, these two activities of Prdx6 are mutually exclusive of each other as a function of the pH of the cellular compartments. Differential substrate preference at different pH (i.e. peroxidised phospholipids at neutral pH and reduced phospholipids at acidic pH) is considered to be the reason for this behavior. To gain insight into the pH-induced structural–functional interplay we have systematically evaluated

Review Paper | Published: 12 June 2021

Exploiting Emojis in Sentiment Analysis: A Survey

Vandita Grover

Journal of The Institution of Engineers (India): Series B **103**, 259–272 (2022) | Cite this article

Abstract

Sentiment analysis is now a prominent field of interest owing to a growing trend of users expressing their opinions on social media, review pages, feedback forms, and other online channels. The machine learning approach to sentiment analysis focuses on feature extraction methods like constructing lexicons to learn sentiment polarity or learning word embeddings and applying them for their use in machine learning algorithms for sentiment classification. But most popular machine learning approaches still cannot capture nuanced emotions like sarcasm, irony, etc. Emojis are now being used along with text by the users to express emotions and hence can help researchers improve sentiment classification tasks. Sentiment analysis powered by emojis is still in the nascent phase and has gained some pace in the last five years. The primary goal of this paper is to discuss the use of emojis that supplement the

Sections Figures References

Materials Technology ›
Advanced Performance Materials
Volume 37, 2022 - Issue 10

Research Article

Optimisation of dielectric spacer layer thickness in Ag nanospheres/ITO/c-Si structure for plasmonic solar cells using FDTD simulation

Manju Rani, Jyoti Kashyap, Udaibir Singh & Avinashi Kapoor

Pages 1320-1328 | Received 27 Apr 2021, Accepted 01 Jun 2021, Published online: 15 Jun 2021

Download citation | https://doi.org/10.1080/10667857.2021.1940046 | Check for updates

ABSTRACT

The thickness of dielectric spacer layer (DSL) plays an important role in performance of plasmonic solar cells. In this work, effect of thickness variation of ITO (indium tin oxide) DSL in silver (Ag) nanospheres/ITO/crystalline silicon(c-Si) structure on forward and backward scattering efficiencies has been investigated. Simulations were carried out using the open-source software MEEP via FDTD method for Ag nanospheres of sizes 50nm, 80nm and 100nm. Maximum forward scattering was observed with 80nm

Original Paper | Published: 06 January 2021

Applicability of Field Plate in Double Channel GaN HEMT for Radio-Frequency and Power-Electronic Applications

Nisha Chugh, Manoj Kumar, Subhasis Haldar, Monika Bhattacharya & R.S. Gupta

Silicon **14**, 1029–1038 (2022) | Cite this article

Abstract

In the present communication, for the first time, applicability of Field Plate (FP) for Double Channel (DC) AlGaN/GaNHEMT is demonstrated. Impact of design space parameters such as field plate length (L_{FP}) and Silicon Nitride thickness (t_{SiN}) on breakdown voltage of DC HEMT is investigated and benchmarked with Single Channel (SC) HEMT. The investigation is carried out using ATLAS Technological Computer Aided Design (TCAD) Simulation tool, which is an efficient method in terms of time and cost to analyze and understand DC HEMT prior to the fabrication. The simulation shows new findings that breakdown voltage of DC device exhibited a large deviation with that of SC device. The breakdown voltage deviation is well corroborated

Recent Advances in Polymer Solar Cells

View this Special Issue

Research Article | Open Access

Volume 2021 | Article ID 7013154 | https://doi.org/10.1155/2021/7013154

Show citation

Gamma Rays Induced Modification in Ultrahigh Molecular Weight Polyethylene (UHMWPE)

Suveda Aarya,[1] Pawan Kumar,[2] Mamta Bhatia,[2] Sanjeev Kumar,[3] Jyotsna Sharma,[4] and **Siddhartha**[2]

Show more

Academic Editor: Zeyun Xiao

Received	Revised	Accepted	Published
26 Jul 2020	16 Apr 2021	26 May 2021	08 Jun 2021

Abstract

Modifications taking place in ultrahigh molecular weight polyethylene (UHMWPE) films due to gamma ray radiation-induced and investigated in correlation with the applied doses. Films were irradiated in a vacuum at room temperature by a 1.25 MeV Co^{60} a source with doses ranging from 0 to 300 kGg. The optical, chemical, structural, and surface morphological properties of the irradiated and unirradiated UHMWPE films

Related articles

Effect of Different Gamma Dose and Chemical Etching on Pre- and Post-Alpha-Irradiated PM-355 Polymer

Mostafizur Rahaman | Govindasami

Superficial Synthesis of CdS Quantum Dots for an Efficient Perovskite-Sensitized Solar Cell

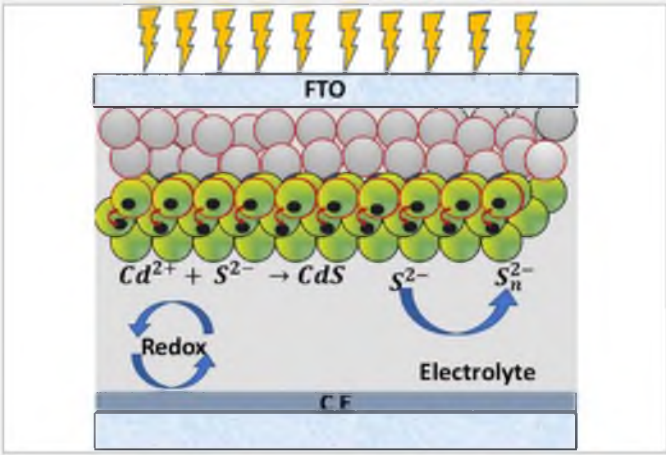
Rakesh K. Sonker*, Rajkamal Shastri, and Rahul Johari

Cite this: *Energy Fuels* 2021, 35, 9, 8430–8435
Publication Date: April 9, 2021
https://doi.org/10.1021/acs.energyfuels.1c00629

Energy & Fuels

Abstract

In this paper, a thorough investigation of cadmium sulfide nanoparticle characteristics has been studied as a result of the wide attention and enormous application in a solar cell. Perovskite-sensitized solar cells (PSSCs) are a favorably effectual and sanitary hybrid, organic–inorganic solar cell device. The simple way uses synthesized cost-effective CdS quantum dots (QDs) via the sol–gel approach and also investigates their structural, electronic, and vibrational properties of CdS nanoparticles with the density functional theory method in B3LYP. Moreover, we use high-resolution transmission electron microscopy (HRTEM) techniques to confirm our calculations and acquire good agreement to the structural analysis of CdS QD formation. The maximum grain diameter is obtained from a HRTEM image, at ~4 nm. The particle size analyzer that obtained ~4 nm of CdS QD nanoparticles was determine via a dynamic light scattering study. The results demonstrated that the fabricated CdS QD-based dye-sensitized solar cell and PSSC represented a maximum power conversion efficiency (η) of 0.5 and 1.8% at 1 sun condition. This efficiency was improved by approximately 72%, associated with that of the reference cell.



Original Research Article | Published: 03 March 2021

Influence of lufenuron on the nutrient content and detoxification enzyme expression in *Aedes aegypti* L. (Diptera: Culicidae)

Kungreiliu Panmei, Roopa Rani Samal, P. Lanbiliu & Sarita Kumar

International Journal of Tropical Insect Science **41**, 2965–2973 (2021) | Cite this article

Abstract

Aedes aegypti is of utmost public health concern transmitting various diseases of human health concern. Employment of chemical-based control interventions has induced immunity in mosquitoes, harmed environment, and adversely affected human health and non-targets diverting the research focus on alternate measures. Current study investigates the efficacy of an Insect Growth Regulator, lufenuron, against early fourth instars of *Ae. aegypti*. The larvae exposed to lufenuron for 24 h were assessed for the effects on the development and adult emergence. The impact of sub-lethal and median-lethal dose of lufenuron was determined on the nutrients and detoxification enzymes of *Ae. aegypti*. The larvae exposed to lufenuron

Original Research Article | Published: 02 October 2020

Cuticular thickening associated with insecticide resistance in dengue vector, *Aedes aegypti* L.

Roopa Rani Samal & Sarita Kumar

International Journal of Tropical Insect Science **41**, 809–820 (2021) | Cite this article

229 Accesses | **8** Citations | Metrics

Abstract

Aedes aegypti is a globally spread disease vector of supreme concern, primarily controlled by chemical insecticides. Current study investigates the comparative rate of acetamiprid and deltamethrin resistance development in *Ae. aegypti* larvae and; possible correlation between resistance and cuticular thickening. The larvae were selected with LC_{90} level of the respective insecticide for 10 successive generations and the level of resistance induced was estimated. The larvae of parent (PS), acetamiprid-selected (ACSF-10) and deltamethrin-selected (DLSF-10) strains were sectioned through first abdominal segment to elucidate the variation in cuticular thickness. The PS larvae of *Ae. aegypti* were 229.26-fold higher susceptible to deltamethrin as compared to acetamiprid, exhibiting corresponding LC_{50} values of

Physiological and reproductive fitness cost in Aedes aegypti on exposure to toxic xenobiotics in New Delhi, India

PDF

Published Feb 12, 2021

DOI https://doi.org/10.31018/jans.v13i1.2470

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Sanskriti School, New Delhi, India
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Sarita Kumar
Insect Pest and Vector Laboratory, Department of Zoology, Acharya Narendra Dev College, University of Delhi, India

Abstract

Aedes aegypti, is a well-known vector of dengue, Chikungunya and Zika at the global level. Primary use of pyrethroids as control interventions has caused the development of a considerable level of immunity in *Ae. aegypti*. The current study assessed the efficacy of a pyrethroid, ?-cypermethrin on the survival and various life parameters of *Ae. aegypti*. The larvicidal studies with ?-cypermethrin revealed the respective LC_{50} and LC_{90} values as 0.26526 mg/L and 0.60211 mg/L. The impact of LC_{50} level was assessed on the growth and life attributes; such as gonotrophic cycle, egg development, hatchability, development and survival of immature stages, adult longevity, reproduction rate and generation time: of fourth instar of susceptible (S) and ?-cypermethrin-exposed population (E). The exposed population showed diminished

Review | Published: 21 June 2021

Proactive role of *Streptomyces* spp. in plant growth stimulation and management of chemical pesticides and fertilizers

M. Kumar, P. Kumar, P. Das, R. Solanki & M. K. Kapur

International Journal of Environmental Science and Technology **19**, 10457–10476 (2022) | Cite this article

641 Accesses | **2** Citations | Metrics

Abstract

In current agriculture practices, various chemical stimulants are being used to enhance crop productivity. However, these chemical fertilizers and pesticides show a deadly impact on the environment, food chain, and human health. The researchers are looking for the biological replacement of these chemical fertilizers and pesticides. Nevertheless, still, no strong bioalternative has replaced the use of such chemicals. Bacteria belonging to the genus *Streptomyces* are well-known producers of secondary metabolites, which can be potentially utilized to replace chemical fertilizers and pesticides. Metabolites from *Streptomyces* can degrade the chemical pesticides, help in the recoupment of essential minerals (e.g., iron,

Dev | J Pure Appl Microbiol | 15(1):20-28 | March 2021
Article 6067 | https://doi.org/10.22207/JPAM.15.1.42
Print ISSN: 0973-7510; E-ISSN: 2581-690X

REVIEW ARTICLE OPEN ACCESS

Exploring Small Heat Shock Proteins (sHSPs) for Targeting Drug Resistance in *Candida albicans* and other Pathogenic Fungi

Rahul Dev

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Abstract

Fungal infections have predominantly increased worldwide that leads to morbidity and mortality in severe cases. Invasive candidiasis and other pathogenic fungal infections are a major problem in immunocompromised individuals and post-operative patients. Increasing resistance to existing antifungal drugs calls for the identification of novel antifungal drug targets for chemotherapeutic interventions. This demand for identification and characterization of novel drug targets leads to the development of effective antifungal therapy against drug resistant fungi. Heat shock proteins (HSPs) are important for various biological processes like protein folding, posttranslational modifications, transcription, translation, and protein aggregation. HSPs are involved in maintaining homeostasis of the cell. A subgroup of HSPs is small heat shock proteins (sHSPs), which functions as cellular chaperones. They are having a significant role in the many cellular functions like development, cytoskeletal organization, apoptosis, membrane lipid polymorphism, differentiation, autophagy, in infection recognition and are major players in various stresses like osmotic stress, pH stress, etc. Studies have shown that fungal cells express increased levels of sHSPs upon antifungal drug induced stress responses. Here we review the important role of small heat shock proteins (sHSPs) in fungal diseases and their potential as antifungal targets.

Keywords: *Candida albicans*, Drug resistance, Small heat shock proteins, Antifungals

ELSEVIER

European Journal of Protistology

Volume 79, June 2021, 125779

Characterization of *Euplotes lynni* nov. spec., *E. indica* nov. spec. and description of *E. aediculatus* and *E. woodruffi* (Ciliophora, Euplotidae) using an integrative approach

Jeeva Susan Abraham [a], Sripoorna Somasundaram [a], Swati Maurya [a], Renu Gupta [b], Seema Makhija [a], Ravi Toteja [a]

Show more

https://doi.org/10.1016/j.ejop.2021.125779

Abstract

Four species belonging to the genus *Euplotes* have been investigated, namely: *E. lynni* nov. spec., *E. indica* nov. spec., *E. aediculatus*, and *E. woodruffi*. All populations are from India and were investigated using morphological and molecular markers. The phylogenetic relationships were inferred from small subunit ribosomal rRNA gene (SSU rRNA), internal transcribed spacer (ITS) region, and mitochondrial cytochrome c oxidase subunit I (COI) gene. Predicted secondary structure models for two new species using the hypervariable region of the SSU rRNA gene and ITS2 region support the distinctness of both species. Morphological characters were subjected to principal component analysis (PCA) and genetic variations were studied in-depth to analyze the relatedness of the two new species with their congeners. An integrative approach combining morphological features, molecular analysis, and ecological characteristics was carried out to understand the phylogenetic position of the reported species within the different clades of the genus *Euplotes*.

ELSEVIER

Carbohydrate Polymers

Volume 261, 1 June 2021, 117851

Review

Guar gum based nanocomposites: Role in water purification through efficient removal of dyes and metal ions

Laishram Saya [a d], Vipin Malik [b], Aarushi Singh [c e], Snigdha Singh [c e], Geetu Gambhir [b], W. Rameshwor Singh [d], Ramesh Chandra [c], Sunita Hooda [b]

https://doi.org/10.1016/j.carbpol.2021.117851

Abstract

Researchers nowadays are relentlessly on a race exploring sustainable materials and techniques for the sequestration of toxic dyes and metal ions from water bodies. Biopolymers such as guar gum, owing to its high abundance, low cost and non-toxicity, are potential candidates in this field. Plenty of hydroxyl groups in the polymer backbone enable guar gum to be functionalised or grafted in a versatile manner proving itself as an excellent starting substance for fabricating upgraded materials meant for diverse applications. This review offers a comprehensive coverage of the role of guar gum-based nanocomposites in removal of dyes and heavy metal ions from waste water through adsorption and photo-catalytic degradation. Isotherm and kinetics models, fabrication routes, characterisation techniques, swelling properties and reusability as well as adsorption and degradation mechanisms are outlined. A detailed analysis with convincing results suggests a good future perspective of implementation of these materials in real-time wastewater treatment technology.

REVIEW article

Front. Microbiol., 12 January 2021
Sec. Antimicrobials, Resistance and Chemotherapy
Volume 11 - 2020 | https://doi.org/10.3389/fmicb.2020.607099

This article is part of the Research Topic
Insights into New Strategies to Combat Biofilms
View all 29 Articles >

Recent Advances in a Polydopamine-Mediated Antimicrobial Adhesion System

 Indu Singh[1]  Gagan Dhawan[1*] Seema Gupta[1*] Pradeep Kumar[2*]

[1] Acharya Narendra Dev College, University of Delhi, Delhi, India
[2] Nucleic Acids Research Laboratory, CSIR-Institute of Genomics and Integrative Biology, Delhi, India

The drug resistance developed by bacteria during antibiotic treatment has been a call to action for researchers and scientists across the globe, as bacteria and fungi develop ever increasing resistance to current drugs. Innovative antimicrobial/antibacterial materials and coatings to combat such infections have become a priority, as many infections are caused by indwelling implants (e.g., catheters) as well as improving postsurgical function and outcomes. Pathogenic microorganisms that can exist either in planktonic form or as biofilms in water-carrying pipelines are one of the sources

Original Paper | Published: 22 September 2020

Antimicrobial, radical scavenging, and dye degradation potential of nontoxic biogenic silver nanoparticles using *Cassia fistula* pods

Indu Singh, Seema Gupta, Hemant K. Gautam, Gagan Dhawan & Pradeep Kumar

Chemical Papers **75**, 979–991 (2021) | Cite this article

241 Accesses | **7** Citations | Metrics

Abstract

Synthesis of metallic nanoparticles via green approach holds great potential in diverse fields of biotechnology and medicine with special mention to silver nanoparticles (AgNPs) which undoubtedly display antimicrobial, radical scavenging, and dye degradation properties. Currently, there is a need to explore more cost-effective and efficient methods to synthesize AgNPs. In this study, we have synthesized biogenic AgNPs using an aqueous extract of a flowering plant of the legume family, Fabaceae, subfamily Caesalpiniaceae, *Cassia fistula*, which is also well known for its medicinal values. Spectroscopically and physicochemically characterized AgNPs were evaluated for their cytocompatibility, antimicrobial effects, antioxidant and catalytic activity to establish their potential for various biomedical applications. DLS studies revealed their size ~ 237 nm with the surface charge of ~ − 30 mV. The results of the zone of inhibition and MIC assays showed the superiority of the activity of these particles over the pod extract. Catalytic reduction of toxic p-nitrophenol to benign p-

Trends In Carbohydrate Research, Vol.13, No.1 (2021) 1-11 0975-0304/09

Trends in Carbohydrate Research

website: www.trendscarbo.com

Applications of Chitosan in Tissue Engineering

Smriti Rekha Deka,[1,*] Seema Gupta,[2] Pradeep Kumar[1,*]

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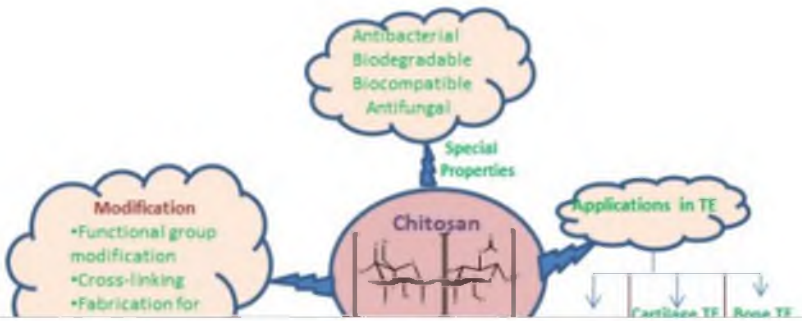
[2]Acharya Narendra Dev College, University of Delhi, Kalkaji, New Delhi- 110019, India

Received: December 12, 2020, Revised: March 28, 2021, Accepted: March 29, 2021

GRAPHICAL ABSTRACT



Trends In Carbohydrate Research, Vol.13, No.1 (2021) 71-81

0975-0304/09

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Trends in Carbohydrate Research

website: www.trendscarbo.com

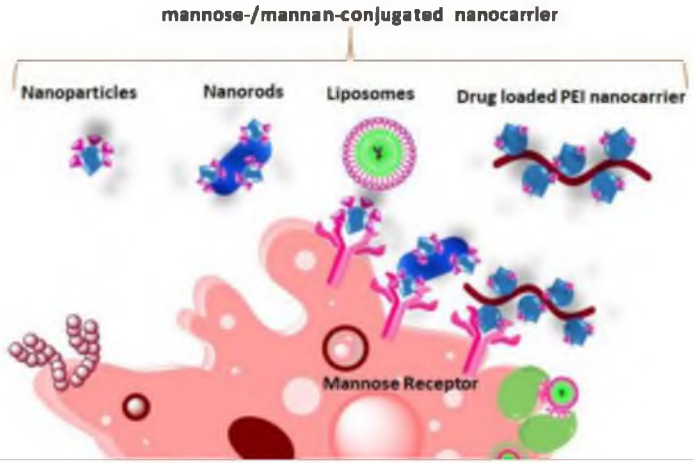
Mannosylated and mannan-modified nanovectors targeting Resident Tissue Macrophages (RTM) for efficient pharmacotherapy

Indu Singh,[1,2] Seema Gupta,[2] Gagan Dhawan,[2] Pradeep Kumar[1]*

[1]CSIR-Institute of Genomics and Integrative Biology, Mall Road, Delhi-110007, India
[2]Acharya Narendra Dev College (University of Delhi), Govindpuri, Kalkaji, New Delhi- 110019, India

Received: January 01, 2021, Revised: March 28, 2021, Accepted: March 30, 2021

Graphical Abstract



Journal of Biomolecular Structure and Dynamics ›
Volume 40, 2022 - Issue 17

Review Article

A review targeting the infection by CHIKV using computational and experimental approaches

Durgesh Kumar, Kamlesh Kumari, Ramesh Chandra, Pallavi Jain, Lata Vodwal, Geetu Gambhir & ...show all

Pages 8127-8141 | Received 04 Jun 2020, Accepted 11 Mar 2021, Published online: 30 Mar 2021

Download citation | https://doi.org/10.1080/07391102.2021.1904004

Abstract

The rise of normal body temperature of 98.6 °F beyond 100.4 °F in humans indicates fever due to some illness or infection. Viral infections caused by different viruses are one of the major causes of fever. One of such viruses is, Chikungunya virus (CHIKV) is known to cause Chikungunya fever (CHIKF) which is transmitted to humans through the mosquitoes, which actually become the primary source of transmission of the virus. The genomic structure of the CHIKV consists of the two open reading frames (ORFs). The first one is a 5' end ORF and it encodes the nonstructural protein (nsP1-nsP4). The second is a 3' end ORF and it encodes the structural proteins, which is consisted of capsid, envelope (E), accessory peptides, E3 and 6 K. Till date, there is no effective vaccine or medicine available for early detection of the CHIKV infection and appropriate diagnosis to cure the patients from the infection. NSP3 of CHIKV is the prime target of the researchers as it is responsible for the catalytic activity. This review has updates of literature on CHIKV; pathogenesis of CHIKV; inhibition of CHIKV using theoretical and experimental approaches.

Communicated by Ramaswamy H. Sarma

Keywords: CHIKV | docking | MD simulations | inhibition

LUMINESCENCE

Volume 36, Issue 6
September 2021
Pages 1531-1543

RESEARCH ARTICLE

Synthesis, comparative *in vitro* antibacterial, antioxidant and UV fluorescence studies of bis indole Schiff bases and molecular docking with ct-DNA and SARS-CoV-2 M^{pro}

Sugandha Singhal, Pankaj Khanna, Leena Khanna

First published: 04 June 2021 | https://doi.org/10.1002/bio.4098 | Citations: 11

Funding information: Guru Gobind Singh Indraprastha University, Grant/Award Number: FRGS; Faculty Research Grant Scheme (FRGS)

Read the full text > PDF TOOLS SHARE

Abstract

In this study, synthesis of 15 novel bis indole-based Schiff bases (SBs) **4a**–**4o** was conducted by condensation of 2-(1-aminobenzyl)benzimidazole with symmetrical bis-

ChemistrySelect
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European Chemical Societies Publishing

Volume 6, Issue 17
May 7, 2021
Pages 4112-4123

Full Paper

Multitarget Diallyl Disulfides (DADS) against Aβ Aggregation: Screening through Molecular Docking with $Aβ_{42}$ & Zn^{II}-$Aβ_{16}$, ADME, DFT & Synthetic Strategy

Sugandha Singhal, Dr. Pankaj Khanna, Dr. Neeti Misra, Dr. Leena Khanna

First published: 30 April 2021 | https://doi.org/10.1002/slct.202004635 | Citations: 1

Read the full text ›

PDF TOOLS SHARE

Biotechnologically relevant enzymes and proteins | Published: 16 April 2021

Screening of compound library identifies novel inhibitors against the MurA enzyme of *Escherichia coli*

Diksha Raina, Harshita Tiwari, Smriti Sharma, Deepika, Praveen Kumar Chinthakindi, Amit Nargotra, Payare L. Sangwan, Kandasamy Eniyan, Urmi Bajpai, Ram A. Vishwakarma, Farrah Gul Khan, Saurabh Saran & Inshad Ali Khan

Applied Microbiology and Biotechnology **105**, 3611–3623 (2021) | Cite this article

Abstract

Bacterial cell has always been an attractive target for anti-infective drug discovery. MurA (UDP-*N*-acetylglucosamine enolpyruvyl transferase) enzyme of *Escherichia coli* (*E.coli*) is crucial for peptidoglycan biosynthetic pathway, as it is involved in the early stages of bacterial cell wall biosynthesis. In the present study we aim to identify novel chemical structures targeting the MurA enzyme. For screening purpose, we used *in silico* approach (pharmacophore based strategy) for 52,026 library compounds (Chembridge, Chemdiv and in house synthetics) which resulted in identification of 50 compounds. These compounds were screened in vitro against MurA enzyme and release of inorganic phosphate (Pi) was estimated. Two compounds (IN00152 and IN00156) were found to inhibit MurA enzyme > 70% in primary screening and IC_{50} of 14.03 to 32.30 µM respectively. These two hits were further evaluated for their mode of inhibition studies and whole-cell activity where we observed 2-4 folds increase in activity in presence of Permeabilizer EDTA (Ethylenediaminetetraacetic

SHELTER BUILDING BEHAVIOUR OF *HASORA CHROMUS* (CRAMER, 1780) LARVAE (INSECTA: LEPIDOPTERA: HESPERIIDAE)

RAJESH CHAUDHARY
Department of Biomedical Science, Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, New Delhi-110019, India.
rajeshchaudhary@andc.du.ac.in

Reviewer: Peter Smetacek

Abstract
Larvae of many lepidopterans, including those belonging to the family Hesperiidae, construct leaf shelters. It has been indicated that these shelters confer protection to larvae from predators and harsh environmental conditions. The repertoire of shelter architectures constructed by given genera or species of Hesperiidae is fairly predictable. Thus, shelter building behaviour can also be important from the perspective of evolution. The present study provides an insight into shelter building behaviour of larvae of Common Banded Awl, *Hasora chromus* (Cramer), including various designs of shelter that larvae can make, and the role of shelters protection from predators. *H. chromus* larvae were found to construct at least four broad architectural types of shelters by folding and tying leaves. The shelters function as a barrier for arthropod predators (including wasps and spiders), and also effective in protecting larvae from avian predators too.
Keywords: Common Banded Awl, *Hasora chromus*, Hesperiidae, Larva, Ecobiology, Shelter-building, Predation, Protection.

Introduction

Larvae of lepidopterans have devised several ways to protect themselves from predators as well as environmental conditions such as solar heat, dislodgement due to shaking or wind blow (Greeney et al., 2015). Their protective strategies include chemical, physiological, morphological, and behavioural defences association with other organisms and avoiding encounters with predators by constructing shelters (Greeney et al., 2015). The latter strategy, *i.e.* shelter making, is widely utilized by larvae of Hesperiidae (Greeney et al., 2003). The larvae of this butterfly family construct shelters with a diverse array of architecture through precisely executed actions, including cutting, rolling, folding and tying a portion or whole of a leaf or several species is largely predictable, and this may be important from the point of view of phylogeny of this group of butterflies (Greeney et al., 2003, 2010; Greeney 2009). However, studies on shelter building behaviour, architectural details of shelter and its protective values (protection from predators and harsh environment) for larvae have not received much attention, particularly for Indian hesperids. In the present communication, these aforementioned aspects have been reported for Common Banded Awl (*Hasora chromus* Cramer, 1780), a common hesperid butterfly found in most parts of India. *Hasora chromus* lays eggs singly or in groups of 2-3 eggs on nascent leaves of its host plant. There are five larval instars, live in self-constructed leaf

Appl. Math. Inf. Sci. 15, No. 2, 189-197 (2021)

Applied Mathematics & Information Sciences
An International Journal

http://dx.doi.org/10.18576/amis/150211

Properties of Motion of the Infinitesimal Variable Mass Body in the Well Known Circular Restricted Three-Body Problem with Newtonian and Yukawa Potential

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[1]International Center for Advanced Interdisciplinary Research (ICAIR), Ratiya Marg, Sangam Vihar, New Delhi, India
[2]Department of Mathematics, Acharya Narendra Dev College,University of Delhi, Delhi-110019, India
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Received: 2 Jan. 2021, Revised: 3 Feb. 2021, Accepted: 25 Feb 2021
Published online: 1 Mar. 2021

Abstract: The effects of Newtonian and Yukawa gravitational potentials are studied on the circular restricted three-body system under the assumption that infinitesimal body varies its mass according to Jeans law. The equations of motion are determined under these perturbations. The numerical studies are conducted where locations of equilibrium points, regions of motion, trajectories with Poincaré surfaces of section and the basins of attraction have been investigated by well known software Mathematica. Moreover, the stability of the locations of equilibrium points are determined and it was found that all these points are unstable.

Keywords: Attracting domain, Newtonian potential, Variable mass, Trajectories, Yukawa potential.

1 Introduction

[6], [7], [8], [9], have explored the effect of oblateness on

American Journal of Mathematical and Management Sciences ›
Volume 40, 2021 - Issue 4

Research Article

On Estimating Scale Parameter of the Selected Pareto Population under the Generalized Stein Loss Function

K. R. Meena, Aditi Kar Gangopadhyay & Omer Abdalghani

Pages 357-377 | Published online: 19 Mar 2021

Download citation | https://doi.org/10.1080/01966324.2021.1891999

Abstract

The problem of estimation after selection can be seen in numerous statistical applications. Let $X_{i1}, \ldots, X_{in}$ be a random sample drawn from the population $\Pi_i, i = 1, \ldots, k$, where Π_i follows Pareto distribution with an unknown scale parameter θ_i and common known shape parameter β. This article is concerned with the problem of estimating θ_L (or θ_S), the scale parameter of the selected Pareto population under the generalized Stein loss function. The uniformly minimum risk unbiased (UMRU) estimators of θ_L and θ_S, scale parameters of the largest and the smallest population respectively, are determined. For $k = 2$, we have obtained a sufficient condition of minimaxity of θ_S and showed that the generalized Bayes estimator of θ_S is a minimax estimator for $k = 2$. Also, a class of linear admissible estimators of the form $dX_{(2)}(dX_{(1)})$ of θ_L and θ_S is found, and a sufficient condition for inadmissibility is provided. Further, we demonstrate that the UMRU estimator of θ_S is inadmissible. A comparison between the proposed estimators is conducted using MATLAB software and a real data set is analyzed for illustrative purposes. Finally, conclusions and discussion are reported.

KEY WORDS AND PHRASES: Generalized Bayes estimators | generalized Stein loss (GSL) function | inadmissibility | minimaxity | Pareto distributions | UMRU estimator

Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19

Review | Open Access | Published: 22 November 2021 | 11, 53–78 (2022)

Infectious Diseases and Therapy

Aims and scope →

Submit manuscript →

Ritam Das, Komal Kotra, Pulkit Singh, Belinda Loh, Sebastian Leptihn & Urmi Bajpai

A Correction to this article was published on 25 January 2022

This article has been updated

Abstract

Antimicrobials are essential for combating infectious diseases. However, an increase in resistance to them is a major cause of concern. The empirical use of drugs in managing COVID-19 and the associated secondary infections have further exacerbated the problem of antimicrobial resistance. Hence, the situation mandates exploring and developing efficient alternatives for the treatment of bacterial and fungal infections in patients suffering from COVID-19 or other viral infections. In this review, we have described the alternatives to conventional antimicrobials that have shown promising results and are at various stages of

Synthesis and Characterization of Nanoselenium: A Step-by-Step Guide for Undergraduate Students

Gagan Dhawan*, Indu Singh, Uma Dhawan*, and Pradeep Kumar*

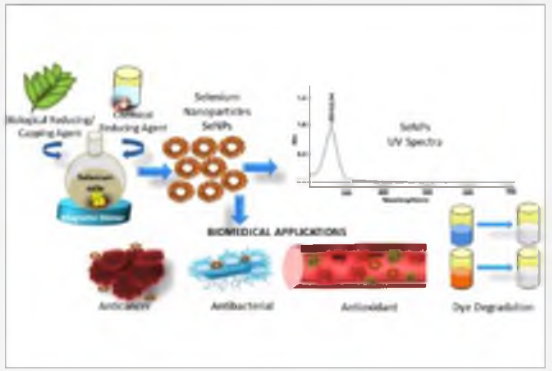
Cite this: *J. Chem. Educ.* 2021, 98, 9, 2982−2989
Publication Date: August 20, 2021
https://doi.org/10.1021/acs.jchemed.0c01467

Journal of Chemical Education

Read Online | PDF (5 MB)

SUBJECTS: Metal nanoparticles, Nanoparticles, Selenium, Sodium, Students

Abstract



Nanoparticle synthesis is an important area of nanotechnology and has been performed by undergraduate students frpm various universities across the globe. Due to the availability of massive data on the synthesis of a wide variety of metallic nanoparticles, including silver, gold, selenium, zinc, copper, iron, palladium, platinum, titanium, etc., and their oxides, it has become tedious to select an ideal and workable protocol for their synthesis. Herein, we have focused on the standardized chemical and biological methodologies to prepare selenium nanoparticles (SeNPs or nanoselenium). Chemical methods exploit chemicals such as sodium selenite (Na_2SeO_3) and reductants (L-ascorbic acid, glutathione, etc.), along with stabilizing agents (Polysorbate 20, protic acid, lysozyme). Although these methods have been used for commercial purposes, they suffer from several drawbacks such as the use of excessive additives for controlled morphology, multistep synthesis, high running cost, and environmental toxicity. Biogenic synthesis using plant materials and microorganisms (algae, fungi, yeast, bacteria, and viruses), on the other hand, is a sustainable, environment-friendly, and cost-effective approach. The natural reducing agents facilitate the conversion of selenium salts into nanosized selenium particles in a single step and act as capping and stabilizing agents, which impart synergism in biological activities. Physical methods such as hydrothermal, irradiation, pulsed laser ablation, etc., have also been used for their production; however, high cost, stringent conditions, and high energy consumption have hampered their applications. Herein, we present a step-by-step methodology using chemical and biological reducing agents to synthesize selenium nanoparticles which will assist the undergraduate learners in selecting a well-tested method based on the conditions of an experiment and desired applications.

KEYWORDS: Second-Year Undergraduate, Upper-Division Undergraduate, Interdisciplinary/Multidisciplinary, Laboratory Instruction, Hands-On Learning/Manipulatives, Applications of Chemistry, Green

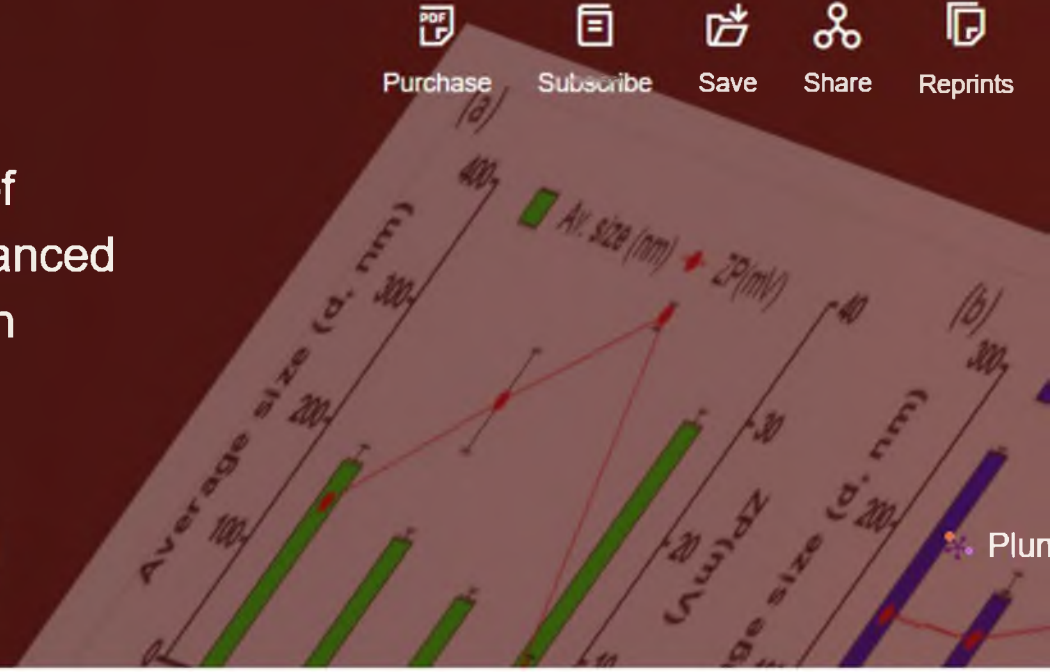
Journal of Pharmaceutical Sciences

PHARMACEUTICAL NANOTECHNOLOGY | VOLUME 110, ISSUE 8, P3047-3060, AUGUST 2021

Self-Assembled Biodegradable Core-Shell Nanocomposites of Amphiphilic Retinoic Acid-LMW bPEI Conjugates Exhibit Enhanced Transgene Expression in Hepatocellular Carcinoma Cells With Inherent Anticancer Properties

Zeba Ahmadi • Harekrushna Jena • Mahak Singh • Gagan Dhawan • Pradeep Kumar

Published: April 29, 2021 • DOI: https://doi.org/10.1016/j.xphs.2021.04.016 •



Abstract

Low molecular weight branched polyethylenimines (LMW bPEIs) are almost nontoxic but display poor transfection efficiency due to lack of adequate complexation ability with nucleic acids followed by transportation across the cell membrane. Here, a series of amphiphilic retinoyl-bPEI conjugates (RP-1, RP-2 and RP-3) has been synthesized by allowing the reaction between bPEI (1.8 kDa) and a bioactive and hydrophobic vitamin A metabolite, all-*trans*-retinoic acid (ATRA), in varying

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Chinese Chemical Letters

Volume 32, Issue 11, November 2021, Pages 3342-3354

Review

Fluorine-containing pharmaceuticals approved by the FDA in 2020: Synthesis and biological activity

Yingjie Yu [a], Aiyao Liu [a], Gagan Dhawan [b], Haibo Mei [a], Wei Zhang [c], Kunisuke Izawa [d], Vadim A. Soloshonok [e f], Jianlin Han [a]

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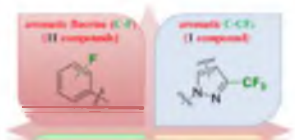
https://doi.org/10.1016/j.cclet.2021.05.042

Abstract

Thirteen new fluorine-containing drugs, which have been granted approval by the US Food and Drug Administration (FDA) in 2020, are profiled in this review. Therapeutic areas of these new fluorinated pharmaceuticals include medicines and diagnostic agents for Cushing's disease, neurofibromatosis, migraine, Alzheimer's disease, myelodysplastic syndromes, hereditary angioedema attacks, and various cancers. Molecules of these approved drugs feature aromatic fluorine (Ar-F) (11 compounds), aromatic Ar-CF_3 (1), aliphatic CHF (1) and CF_2 (1) groups. For each compound, we provide a spectrum of biological activity, medicinal chemistry discovery, and synthetic approaches.

Graphical abstract



Current Protein & Peptide Science

Editor-in-Chief »

ISSN (Print): 1389-2037
ISSN (Online): 1875-5550

Review Article

Peroxiredoxin-6: A Guardian of Lung Pathophysiologies

Author(s): Anju Kumari, Rimpy Kaur Chowhan, Pushpa Kakchingtabam, Sharifun Shahnaj, Hamidur Rahaman, Mohd Saquib Ansari and Laishram Rajendrakumar Singh*

Volume 22, Issue 9, 2021

Page: [666 - 674]

Pages: 9

DOI: 10.2174/1389203722666211109101853

Price: $65

Abstract

The moonlighting protein, Prdx-6, exhibits peroxidase activity, phospholipase activity, and lysophosphatidylcholine acyltransferase (LPCAT) activity. Although it is ubiquitous in expression, its level is prominently high in the lung. Prdx-6 has been known to be an important enzyme for the maintenance of normal lung physiologies including, anti-oxidant defense, lung surfactant homeostasis, and cell signaling. Studies further unveiled that the altered activity (peroxidase or ai- PLA2) of this enzyme is linked with various lung pathologies or diseases. In the present article, we attempted to address the various pathophysiologies or disease conditions (like lung ischemia, hyperoxia, lung cancer, emphysema, and acute lung injury) wherein Prdx-6 is involved. The study implicates that Prdx-6 could be used as a common drug target for multiple lung diseases. Important future insights have also been incorporated.

Keywords: Peroxiredoxin-6 , reactive oxygen species (ROS) , antioxidants , hyperoxia , acute lung injury , pulmonary microvascular endothelial

Review

Signaling mechanisms and biochemical pathways regulating pollen-stigma interaction, seed development and seedling growth in sunflower under salt stress

Satish C. Bhatla, Mansi Gogna, Prachi Jain, Neha Singh, Soumya Mukherjee & Geetika Kalra

Article: 1958129 | Received 23 Jun 2021, Accepted 15 Jul 2021, Published online: 25 Aug 2021

Download citation | https://doi.org/10.1080/15592324.2021.1958129

ABSTRACT

Sunflower (*Helianthus annuus* L.) is one of the major oilseed crops cultivated world over for its high-quality oil rich in linoleic acid. It also has established applications in pharmaceutical and biotechnological industries, mainly through recombinant production of unique oil body (OB) membrane proteins-oleosins, which are used for producing a wide variety of vaccines, food products, cosmetics and nutraceuticals. The present review provides a critical analysis of the progress made in advancing our knowledge in sunflower biology, ranging from mechanisms of pollen-stigma interaction, seed development, physiology of seed germination and seedling growth under salt stress, and finally understanding the signaling routes associated with various biochemical pathways regulating seedling growth. Role of nitric oxide (NO) triggered post-translational modifications (PTMs), discovered in the recent past, have paved way for future research directions leading to further understanding of sunflower developmental physiology. Novel protocols recently developed to monitor temporal and spatial distributions of various biochemicals involved in above-stated developmental events in sunflower, will go a long way for similar applications in plant biology in future.

Published: 08 March 2021

Unraveling the AM fungal community for understanding its ecosystem resilience to changed climate in agroecosystems

Dipanti Chourasiya, Manju M. Gupta, Sumit Sahni, Fritz Oehl, Richa Agnihotri, Reena Buade, Hemant S Maheshwari, Anil Prakash & Mahaveer P Sharma

Symbiosis **84**, 295–310 (2021) | Cite this article

Abstract

The changing global climate affects the agroecosystem making it challenging to achieve the world's sustainable development goals. Among the facets of belowground microbial communities, the arbuscular mycorrhizal fungi (AMF) hold an important place. They represent the most common symbiont phylum colonizing more than 80% of the plant families and are likely to be affected by global climate change. These fungi facilitate plant's mineral acquisition, improving growth and protecting them from biotic and abiotic stresses. The elevated carbon dioxide (eCO_2) level, temperature, increased nitrogen and phosphorus deposition influences the plant phenology and AMF functioning through changes in diversity and community composition of AMF. The interaction effects of soil management practices due to climate change affect the system productivity and perturb mineral cycling. Understanding the carbon and nitrogen cycling of an agro-ecosystem and its associated AMF communities concerning ecosystem productivity is the need of the hour. Plant-fungal associations require a

Issue 22, 2021

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From the journal:
Dalton Transactions

Al_2O_3/CuI/PANI nanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives†

Check for updates

Sahil Kohli, [ab] Garima Rathee, [a] Sunita Hooda *[b] and Ramesh Chandra *[a]

Author affiliations

Abstract

This work is generally focused on the synthesis of an efficient, reusable and novel heterogeneous Al_2O_3/CuI/PANI nanocatalyst, which has been well synthesized by a simple self-assembly approach where aniline is oxidized into PANI and aniline in the presence of KI also acts as a reductant. The nanocatalyst was well characterized by XRD, FTIR, SEM, EDX, TEM, BET and XPS techniques. In this study, the fabricated material was employed for the catalytic one-pot synthesis of 2-substituted benzimidazoles *via* condensation between *o*-phenylenediamine and aldehydes in ethanol as a green solvent. The present method is facile and offers several advantages such as high % yield, less reaction time, and no use of additive/bases. Also, the catalyst showed better values of green metrics including low E-factor: 0.17, high reaction mass efficiency: 85.34%, high carbon efficiency: 94%, and high process mass intensity: 1.17.

Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti

PDF

Published Dec 16, 2021

DOI https://doi.org/10.31018/jans.v13i4.3018

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Sarita Kumar
Department of Zoology, Acharya Narendra Dev College, University of Delhi, Kalkaji, New Delhi-110019, India

Abstract

Aedes aegypti management is a global concern due to the absence of medication and effective vaccines. The pesticide-mediated health hazards and rising insecticide resistance in mosquitoes have aggravated the issues. As graphene Oxide (GO)-based nanoformulations are considered a novel mosquito management strategy; the present investigation evaluated the efficacy of GO based nanoformulations conjugated with malathion (ML) and endosulphan (EN) against *Ae. aegypti*. The GO was synthesised by Hummers' method and was confirmed by UV-visible spectral analysis. The GO-ML and GO-EN binary mixtures (1:1 and 1:2) were assayed for toxic potential against mosquito larvae as per WHO protocol and the dead larvae were scrutinized for morphological deformations/abnormalities. The contact irritancy potential of GO nanoformulations was also evaluated against adult *Ae. aegypti*. The UV-visible spectrum of GO showed a narrow and high peak at ~300 nm corresponding to an n-π^* plasmon peak. The GO-insecticide binary mixtures augmented the ML and EN toxicity by 80.43% and 6.43-fold, respectively. The GO-ML mixture-exposed larvae revealed cuticular deposition of black soot while larvae exposed to GO-EN exhibited disintegrated gut viscera. GO-insecticide combinations increased flights in *Ae. aegypti* denoting irritant potential. The effectual toxic, abrasive and irritant activity of GO-insecticide nanoformulations recommends developing graphene-based toxicants for mosquito management

Outline

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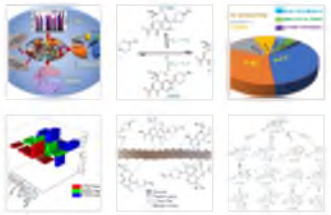

Science of The Total Environment
Volume 813, 20 March 2022, 152529

Review

A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater

Laishram Saya [a b c], Vipin Malik [b], Drashya Gautam [b], Geetu Gambhir [b], Balendra [a], W. Rameshwor Singh [c], Sunita Hooda [b]

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Highlights

- Bioaccumulation of antibiotics like Levofloxacin in the environment is a cause of global concern.
- Maximum studies are carried out on adsorption and AOPs mainly photocatalytic degradation.
- Several photocatalysts exhibited up to 100% degradation of LEV making photocatalytic degradation the best method
- Biological degradation which may prove to be the most environment friendly is less reported for LEV removal.
- Hybrid techniques reserve a great scope of future research in the field.

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Synthetic Communications ›
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Volume 51, 2021 - Issue 19

Synthetic Communications Reviews

"In water" synthesis of bis(indolyl)methanes: a review

Leena Khanna, Mansi, Shilpa Yadav, Neeti Misra & Pankaj Khanna

Pages 2892-2923 | Received 29 May 2021, Published online: 30 Jul 2021

Abstract

Bis(indolyl) methane (BIM) derivatives have shown numerous biological properties which has influenced the scientific fraternity to explore the length and breadth of their synthesis. Mostly, the procedure involves a catalytic electrophilic substitution reaction of indoles with various aldehydes and ketones. However, many variations have been applied from time to time to promote this reaction under green conditions. The use of water as a solvent in organic synthesis, has gained much attention due to economic and eco-friendly reasons. It has also been observed that the reactions under aqueous conditions have shown high reactivities and chemo-selectivity, which are not found in organic media. "In water synthesis" of BIMs has gained considerable recent importance and several methods have been developed. Thus, in this review we have summarized different synthetic protocols used to prepare BIMs under aqueous conditions in the last fifteen years.

Keywords: Green protocols | aqua mediated | bis-indole | nanocatalyst | transition metal catalyst | acid catalysts

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Advanced Materials Letters

A DFT Study of Interaction of $(CdSe)_3$ Quantum Dots with Nucleobases

Document Type : Research Article

Authors
Pragati Malik Rita Kakkar

https://doi.org/10.5185/amlett.2021.081653

Abstract
Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) play important roles in the storage of genetic information and protein biosynthesis. Nucleobases, which are nitrogenous bases, are the functional units of these nucleic acids. It is very important to detect changes in the sequence of DNA/RNA, as any mutations in them may cause harm to the organism. Our aim is to verify the use of $(CdSe)_3$ Quantum Dots (QDs), owing to their distinctive optical and electronic properties, for sensing changes in DNA/RNA. Hence, in this work, we have focused on studying the interaction between $(CdSe)_3$ QDs and the five nucleobases (adenine, guanine, cytosine, thymine and uracil) at various probable sites by means of density functional calculations. Several structural, electronic and optical properties, and charge transfer on interaction between the two, have been discussed. The present band gap and charge transfer calculations indicate that binding of $(CdSe)_3$ to guanine is strongest and is weakest with uracil. The vibrational spectral analysis indicates that the intensities of the peaks due to $(CdSe)_3$ enhance on interacting with the nucleobase, and a blue shift is observed in all the interactions. The presence of both the frontier orbitals (HOMO and LUMO) on the QD indicates that $(CdSe)_3$ acts as a guardian of DNA and prevents it from damage. Hence, our studies direct that CdSe QDs can be successfully employed as sensors for these nucleobases.

Keywords
Nucleobase purine pyrimidine quantum dots sensing HOMO LUMO

Volume 12, Issue 8
August 2021
Pages 1-11

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Research paper | Published: 02 February 2022

Size-dependent structural and electronic properties of stoichiometric II–VI quantum dots and gas sensing ability of CdSe quantum dots: a DFT study

Jyoti Singh, Rakhi Thareja, Pragati Malik & Rita Kakkar

Journal of Nanoparticle Research **24**, Article number: 33 (2022) | Cite this article

350 Accesses | **1** Citations | Metrics

Abstract

The structural, electronic, and quantum confinement effects observed in II–VI quantum dots have been described using density functional theory. Various properties like binding energy, Fermi energy, charge distribution, and band gap of various clusters have been determined as a function of cluster size in order to find out the most stable of all the clusters considered. The binding energies are found to be a function of the cluster size but converge to a maximum. Cadmium is observed to possess a larger tendency to form clusters with higher coordination numbers compared to zinc and mercury. In mercury sulfide $(HgS)_n$, the clusters with $n = 6$ and 13 get dissociated into two graphene-like parallel layers. The adsorptions of single gas molecules on the $(CdSe)_{13}$ quantum dots are exothermic, indicating that most of the gas molecules adsorb spontaneously on the CdSe quantum dots. Among the various gases, O_2 and NO_2 are the gas molecules that get most strongly chemisorbed. The CdSe quantum dot acts as an electron donor when it interacts with the oxidizing gases, O_2, CO, NO_2, and SO_2 gases. The vibrational analysis of the combined systems indicates that the intensities of the peaks due to

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Journal of Catalysis

Volume 401, September 2021, Pages 297-308

Surface engineered Iridium-based magnetic photocatalyst paving a path towards visible light driven C-H arylation and cyanation reaction

Pooja Rana [a], Rashmi Gaur [a], Bhawna Kaushik [a], Pooja Rana [a], Sneha Yadav [a], Priya Yadav [a], Priti Sharma [c], Manoj B. Gawande [b], Rakesh K. Sharma [a]

https://doi.org/10.1016/j.jcat.2021.08.014

Abstract

The report presents the fabrication and application of a highly versatile, magnetic and robust iridium based photoredox nanocatalyst. Herein, $Ir(PPy)_3$ based photocatalyst sites have been chemically engineered over the magnetic nanoparticles to encompass the captivating features of homogeneous iridium photocatalyst with the magnetically recyclable core. A household photoreactor was designed and fabricated to achieve highly selective visible light driven oxidative C-H arylation and C-H cyanation under sustainable and ambient reaction conditions utilizing the Ir@PyBz@ASMNPs photoredox nanocatalyst. The environment friendly Ir@PyBz@ASMNPs shows excellent photocatalytic activity, broad substrate adaptability and outstanding recyclability compared to the analogous homogeneous catalysts. Indeed, the Ir@PyBz@ASMNPs possess some key features including high surface area, high iridium metal loading and excellent stability. This work is expected to enlighten and provide new insights in the rational design of high performance and recoverable photoredox nanocatalyst through surface engineering strategy.

Issue 19, 2021

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From the journal:
Materials Chemistry Frontiers

Unlocking the catalytic potency of a magnetic responsive $CoFe_2O_4$/Ni-BTC MOF composite for the sustainable synthesis of tri- and tetra-substituted imidazoles†

Sneha Yadav,[a] Ranjana Dixit,[a] Shivani Sharma,[a] Sriparna Dutta,[a] Bhavya Arora,[a] Pooja Rana,[a] Bhawna Kaushik,[a] Pooja Rana,[a] Alok Adholeya,[b] Manoj B. Gawande[c] and Rakesh K. Sharma *[a]

Author affiliations

Abstract

With the advancements in materials engineering, unprecedented newer materials based on magnetic MOFs have emerged as one of the promising candidates in the strategic field of catalysis. Within this perspective, the present report unveils the fabrication of an intricately designed magnetic $CoFe_2O_4$/Ni-BTC based MOF composite *via* a one-pot solvothermal approach. The synthesized composite was comprehensively characterized using various analytical tools

Article | Open Access | Published: 24 December 2021

Enhanced catalysis through structurally modified hybrid 2-D boron nitride nanosheets comprising of complexed 2-hydroxy-4-methoxybenzophenone motif

Pooja Rana, Ranjana Dixit, Shivani Sharma, Sriparna Dutta, Sneha Yadav, Aditi Sharma, Bhawna Kaushik, Pooja Rana, Alok Adholeya ✉ & Rakesh K. Sharma ✉

Scientific Reports **11**, Article number: 24429 (2021) | Cite this article

Abstract

Tuning the structural architecture of the pristine two dimensional hexagonal boron nitride (*h*-BN) nanosheets through rational surface engineering have proven advantageous in the fabrication of competent catalytic materials. Inspired by the performance of *h*-BN based nanomaterials in expediting key organic transformations, we channelized our research efforts towards engineering the inherent surface properties of the exclusively stacked *h*-BN

Identifying Central Nodes in Directed and Weighted Networks

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Deshbandhu College,
University of Delhi, Delhi

***Abstract*—An issue of critical interest in complex network analysis is the identification of key players or important nodes. Centrality measures quantify the notion of importance and hence provide a mechanism to rank nodes within a network. Several centrality measures have been proposed for un-weighted, un-directed networks but applying or modifying them for networks in which edges are weighted and directed is challenging. Existing centrality measures for weighted, directed networks are by and large domain-specific. Depending upon the application, these measures prefer either the incoming or the outgoing links of a node to measure its importance. In this paper, we introduce a new centrality measure, *Affinity Centrality*, that leverages both weighted in-degrees as well as out-degrees of a node's local neighborhood. A tuning parameter permits the user to give preference to a node's neighbors in either incoming or outgoing direction. To evaluate the effectiveness of the proposed measure, we use three types of real-world networks - migration, trade, and animal social networks. Experimental results on these weighted, directed networks demonstrate that our centrality measure can rank nodes in consonance to the ground truth much better than the other established measures.**

***Keywords*—Centrality; weighted network; directed network; migration network; world input output trade network; community structure**

I. Introduction

Data analysts from diverse domains represent relationships online social networks [12], [25], detecting influential criminals [9], performing resilience analysis of power grid networks [13], locating key areas of activity in the urban infrastructure of a city [1], and traffic sampling for intrusion detection [28].

Several centrality measures have been formulated to quantify the notion of central nodes in un-weighted/ weighted, un-directed networks and are surveyed in [7], [3], [4], [5]. However, quantification of node centrality is more challenging in complex weighted and directed networks due to the dynamic effect of weighted reciprocal links on its computation. Very few measures exist for such networks, and the area remains under-explored.

A. The Problem and Motivation

PageRank (PR) proposed by Brin and Page to rank web pages is a popular and effective centrality measure [20], and there exist variations and extensions of PR for weighted, directed networks [27], [30]. These measures quantify the importance of a web page by iterative counting of the number and quality of its incoming links. The underlying assumption is that more important web pages have more *incoming* links from other central web pages. The problem is that this assumption, though correct for web pages, may not be valid for other domains. For example, in the migration networks, a state's

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Perception of youth on Digital India

Sunita Narang, Monica Singhania, Surinder Kaur and Shalu Mahajan

Published Online: July 8, 2021 · pp 365-388 · https://doi.org/10.1504/IJBIR.2021.116393

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Abstract

Digital India is seen as the engine for transition of India into an empowered nation. In this direction, several pro-people initiatives like MyGov, Digilocker, e-basta, and e-hospital are being implemented. Through a self-structured survey questionnaire, the study evaluates awareness about, implementation and utilisation of various e-services offered under the Digital India Program among Delhi University students. It examines the extent to which the services are being utilised and main barriers/challenges restricting its utilisation. The data has been analysed using ANOVA. The study reveals a high level of awareness among students. They believe it will improve the quality of services leading to good governance. Major factors restricting its implementation include lack of computer knowledge, fear of frauds and resistance to change. The study stressed on educating people about the benefits and usage of Digital India. The nation as a whole can move towards green and responsible governance by improving its acceptability.

Keywords

youth perception, Delhi University, Digilocker, e-basta, electronic basta, e-governance, electronic governance, Digital India Program, analysis of variance, ANOVA, e-learning, electronic learning, computer knowledge, good governance

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Volume 25 · Issue 3 · 2021

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History

Published Online: July 08, 2021

Keywords

youth perception
Delhi University | Digilocker
e-basta | electronic basta
e-governance
electronic governance

Research Article

International Journal of Advanced Technology and Engineering Exploration, Vol 8(83)
ISSN (Print): 2394-5443 ISSN (Online): 2394-7454
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Intensity quantification of public opinion and emotion analysis on climate change

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Received: 13-July-2021; Revised: 09-October-2021; Accepted: 13-October-2021

Abstract

Human-related activities are primarily accountable for climate change resulting in natural disasters. Therefore, it has become essential to analyze and evaluate public awareness of climate change globally. With the prevalence of social networks like Twitter, sentiment classification has been recognized as a powerful tool to determine public opinion and concern on such ecological issues. Therefore, this study proposes a framework to classify the tweets containing public opinion towards climate change using Bi-directional Long Short-Term Memory (Bi-LSTM) Networks. The proposed framework quantified the intensity of the public opinion classified by the Bi-LSTM model to measure the strength of the public concern towards climate change and validated it using three case studies: Earth Day, Delhi Air Pollution, and Australian Bushfires. The intensity values of the public sentiments concerning these events were obtained as 98.50%, 96.57%, and 98.33%, respectively. The proposed work was further augmented with a lexicon-based emotion analyzer to categorize the emotions associated with the tweets into positive, negative, neutral, and mixed to substantiate the results. This framework can be utilized before enforcing the policy decisions on the general public in any domain.

Keywords

Bi-LSTM networks, Sentiment analysis, Global warming, Social networks, Climate change.

1.Introduction

The large-scale shift in the weather patterns due to intensified global warming is becoming a severe issue globally with constant evolving outlooks. Rising temperatures, melting of glaciers, and changes in weather patterns are some of the indicators of climate change. Increased human emissions on the Therefore, developing appropriate learning techniques to analyze and evaluate public awareness of the critical issues has become an absolute necessity for a promising future. For example, there have been instances of mass protests during the implementation of acts such as the Citizenship Amendment Act of (CAA) 2019 [4] and Farm Bills

RESEARCH-ARTICLE

A smart learning assistance tool for inclusive education

Authors: Sangeeta Srivastava, Ashwani Varshney, Supriya Katyal, Ravneet Kaur, Vibha Gaur Authors Info & Claims

Journal of Intelligent & Fuzzy Systems: Applications in Engineering and Technology, Volume 40, Issue 6 • 2021 • pp 11981–11994 • https://doi.org/10.3233/JIFS-210075

Published: 01 January 2021 Publication History

Journal of Intelligent & Fuzzy Systems:...
Volume 40, Issue 6
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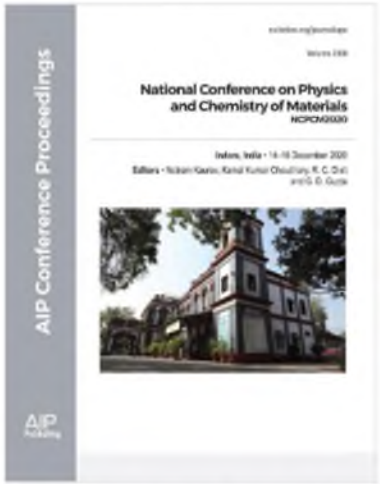
Abstract

The government has established special schools to cater to the needs of children with disabilities but they are often segregated rather than receiving equitable opportunities. Artificial Intelligence

AIP Publishing AIP Conference Proceedings

Volume 2369, Issue 1
13 September 2021



NATIONAL CONFERENCE ON PHYSICS AND CHEMISTRY OF

RESEARCH ARTICLE | SEPTEMBER 13 2021

Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance

Vishal Dhingra; Shani Kumar; Arijit Chowdhuri; Amit Garg

+ Author & Article Information
AIP Conference Proceedings 2369, 020109 (2021)
https://doi.org/10.1063/5.0060996

Efficient and enhanced gas sensing especially at room temperature is the demand for contemporary industrial applications. This has been made possible due to a paradigm shift from semiconducting metal oxides to 2D materials including Graphene Oxide (GO) and reduced GO (RGO). GO and its

NO ACCESS

Optimal ordering policy for deteriorating items with stock dependent demand, partial backlogging and trade credit period

Sachin Kumar Verma, Mohd. Rizwanullah and Chaman Singh

Published Online: September 6, 2021 · pp 95-120 · https://doi.org/10.1504/IJLSM.2021.117709

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Abstract

In this paper, policies of optimal ordering has been focussed on economic order quantity (EOQ) model, where we considered deteriorated as well as non-instantaneous nature items. In this inventory model, we are also assuming there is a stock-dependent demand and constant holding cost. Occurrence of shortage during the complete process of the system, taking into consideration with partial backlogging where deterioration of items follows the Weibull distribution. In the present study, it is considered that the supplier's proposed lucrative trade credit offers to the retailers to buy more to generate more revenue. Numerical examples parallel to the present inventory model gives an optimal result. Lastly, sensitivity analysis applied to different parameters and graphical representations have shown to validate the model.

Keywords

stock dependent demand pattern, partial backlogging, constant holding cost, trade credit, Weibull deterioration

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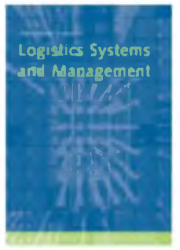

Volume 40 · Issue 1 · 2021

ISSN: 1742-7967
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History

Published Online: September 06, 2021

Keywords

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partial backlogging
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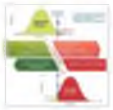
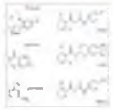

Tables (1)

Table 1

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Acta Ecologica Sinica

Volume 43, Issue 1, February 2023, Pages 11-19

A systematic review on the eco-safe management of mosquitoes with diflubenzuron: An effective growth regulatory agent

Manu Sankar, Sarita Kumar

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https://doi.org/10.1016/j.chnaes.2021.09.019

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Abstract

Mosquitoes serve as the major vector transmitting malaria, dengue, yellow fever and several other diseases of human concern. Rising in mosquito-borne diseases and consequent fatalities throughout the world has made the management of mosquitoes of paramount importance. With the use of various insecticidal agents and their indiscriminate application in the fields for vector control; other issues such as multiple insecticide resistance, lethality to non-specific targets and adverse effects on human and environmental health have emerged making the situation more critical. Hence, the focus of researchers has diverted to the use of Insect Growth Regulators (IGRs) that affect the growth and development of the insects without inducing any appreciable toxic effects. The paper comprehensively reviews various IGRs and their potential use against insect pests and mosquito vectors. A special emphasis has been laid on the utilization of diflubenzuron, its larvicidal potency and growth regulatory effects against mosquitoes. The paper also delivers a detailed discussion on various approaches governing with the application of diflubenzuron. a chitin synthesis inhibitor, for its potent effects over a wide range of other insect species, low toxicity to humans, safety to other non-target animals, negligible deleterious environmental impact along with the possible

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Indigenous Plants Demonstrating Effective Antioxidant Properties

Karmanyaraj Singh Yadav, Roopa Rani Samal, Arunima Sahgal & Sarita Kumar

Biology Bulletin **48**, S62–S72 (2021) | Cite this article

Abstract

Increased production of antioxidant herbal supplements utilizing traditional medicinal plants has been attributed to a high margin of economic effectiveness, environmental friendliness, and accessibility. Current investigations determined the antioxidant properties of leaf and stem extracts of five plants, *Oxalis corniculata*, *Argemone mexicana*, *Thevetia neriifolia*, *Acacia karoo* and *Cassia fistula* using DPPH radical scavenging activity, Xanthine oxidase (XO) inhibition and Superoxide scavenging activity. Based on the individual extract activity, different binary formulations were prepared and assayed for their antioxidant properties to identify the most promising combination. The *A. mexicana* and *A. karoo* leaf extracts showed maximum DPPH activity while highest XO inhibition was induced by *A. mexicana* leaf extract (IC_{50} = 6.849 ± 1.502 µg/mL) followed by the *T. neriifolia* stem extract (IC_{50} = 10.366 ± 0.1.322 µg/mL). Superoxide (SO) scavenging effect of all the extracts was significantly higher in comparison to the control. The combinations of *A. mexicana* and *A. karoo* leaf extracts in 2 : 1 and 3 : 1 ratios; and that of *C. fistula* and *A. karoo* stem extracts exhibited synergistic antioxidant effects in comparison to the individual extracts. The antioxidant activity increased

Journal of Communicable Diseases (E-ISSN: 2581-351X & P-ISSN: 0019-5138)

Formulation of Clitoria ternatea Leaves-mediated Silver Nanoparticles to Control Aedes aegypti Larvae

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Keywords: Larvicide, Nanocomposites, Clitoria ternatea, Aedes aegypti, DLS, SEM, TEM

PDF

Published
2021-09-30

Issue
Vol. 53 No. 3 (2021): Journal of Communicable Diseases

Section
Research Article

Information

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Original Article | Published: 07 May 2021

In vitro and in silico anticancer potential analysis of *Streptomyces* sp. extract against human lung cancer cell line, A549

Prateek Kumar, Anjali Chauhan, Munendra Kumar, Bijoy K. Kuanr, Aditi Kundu, Renu Solanki & Monisha Khanna Kapur

3 Biotech **11**, Article number: 254 (2021) | Cite this article

523 Accesses | **6** Citations | **2** Altmetric | Metrics

Abstract

During our previous investigation, bioactive compounds present in the extract of *Streptomyces* sp. strain 196 were characterized using LC–MS/MS and ^{1}H NMR studies. These compounds were K-252-C aglycone indolocarbazole alkaloid, decoyinine, and cycloheximide; the study of these natural drugs against lung carcinoma is still limited. Focus of the current investigation was to study the anticancer effect of strain 196 extract on lung cancer cells (A549). During in vitro studies, anti-proliferative effect of extract was studied using MTT assay in A549 cells. Effect of extract on cell survival was further evaluated using colony assay. Cell death was qualitatively assessed using apoptosis assay. The aftereffect of extract treatment on metastatic potential of cancerous cells was studied using wound closure assay. Effect of extract on the morphology and cytoskeletal arrangement of A549 cells was studied using phalloidin staining. The extract demonstrated concentration and time-dependent cytotoxicity with IC_{50} value at 0.5 mg/ml (6 h) and 0.15 mg/ml (24 h). The proliferation and metastatic potential of

SIGHTINGS OF THE TAILLESS LINEBLUE *PROSOTAS DUBIOSA* (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN DELHI, INDIA

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Reviewer: Piet van der Poel

The floristic composition of Delhi has changed significantly during past one and half centuries (Maheshwari, 1963; Anonymous, 1991). Several non-native plant species have been introduced for afforestation and beautification of gardens and parks (Maheshwari, 1963). In addition, the city has also witnessed an increased plantation of vegetable and fruit plants (Maheshwari, 1963). Factors such as change in floristic characteristics, appearance of new microhabitats, change in land use and climate change, alone or in combination can cause an alteration to the butterflies species diversity in a geographical area (Kwon *et al.*, 2021; Mukherjee *et al.*, 2019).For instance, in Delhi, a few species of butterflies,such as Common Jay (*Graphium doson* C. & R. Felder, 1864), Red Pierrot (*Talicada nyseus* Guérin-Méneville, 1843) and Plains Cupid (*Chilades pandava* Horsfield, 1829),that are fairly common at present, werenot recordedby previous workers (Donahue, 1967; Larsen,2002). These butterfly species are thought to have been introduced in Delhi duringthe last two decades along with their host plants, which have ornamental value. Also, species which were once considered extremely rare in Delhi such as the Common Lineblue (*Prosotas nora* C. Felder, 1860) and 2019; 2020).Besides these, there is a recent record of the Common Grass Dart (*Taractrocera maevius*) (Madan & Dey, 2018) that had not been reported previously from Delhi.In the present communication, we report sightings of the Tailless Lineblue (*Prosotas dubiosa*) from various parts of Delhi and its vicinity.

Two individuals of the Tailless Lineblue were sighted in the Sanjay Van area (28° 31′ 48″N, 77° 10′ 15″E) of South Delhi during thelate morning on2.x.2021 (Figure 1).Both the individuals were found puddling together on a footpath. These were observed for about 10 minutes and photographed. Another individual of this species was sighted and photographed on the morning of 13.x.2021, basking on a tree inthe R. K. Puram area (28° 33′ 20″N, 77° 10′ 49″E) of New Delhi. It is noteworthy that this butterfly species was also sighted by us on 14.x. and 16.x.2021 (two individuals each day) in Aravalli Biodiversity Park, Gurugram, Haryana (28° 28′ 56″N, 77° 06′ 39″E).Therefore, it islikely that the Tailless Lineblue is present in other parts of Delhi-NCR as well.

To the best of our knowledge, the Tailless Lineblue has not been reported previously from Delhi (Donahue, 1967; Larsen, 2002) or

SIGHTING OF PLAIN TIGER (*DANAUS CHRYSIPPUS* LINN., 1758) FORM *DORIPPUS* IN NEW DELHI, INDIA

RAJESH CHAUDHARY
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Reviewer: Peter Smetacek

Four forms of *Danaus chrysippus* are known from India, viz. *chrysippus, alcippoides, amplifascia* and *dorippus* (Smetacek, 2001). The first form is the most common in the country whereas sighting of the other three forms are rare (Smetacek, 2001). The form *dorippus*, known to be a common form in Africa, is sighted only rarely in India (Smith *et al*., 1997; Smetacek, 2001). This form is

References

Ashton, R. 1972. Butterflies of New Delhi, India (Papilionoidea). *Journal of the Bombay Natural History Society* 69: 502-509.

M. Yuvaraj & P. Smetacek. 2019. First report of *Danaus chrysippus* form *dorippus* (Insecta: Lepidoptera: Nymphalidae) from Andhra Pradesh, India. *Bionotes* 21(3): 65-

GENERA OF ANTS ASSOCIATED WITH LARVAE OF PLAINS CUPID (*CHILADES PANDAVA*, HORSFIELD, 1829) (INSECTA: LEPIDOPTERA: LYCAENIDAE) INFESTING *CYCAS*, IN DELHI, INDIA, AND AN INSIGHT INTO THE NATURE OF THEIR INTERACTION

RAJESH CHAUDHARY[1] AND VINESH KUMAR[2]

[1 & 2]Department of Biomedical Science, Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, New Delhi-110019, India.

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Reviewer: Peter Smetacek

Abstract

Larvae of many species of Lycaenid butterflies are known to associate with ants. With respect to larvae, the association can be facultative or obligatory. Also, larvae of some species of Lycaenids maintain a parasitic, and many others a mutualistic relationship with ants. Larvae of *Chilades pandava* (Lepidoptera:Lycaenid:Polyommatini) -a butterfly that has recently extended its range along with the artificial introduction of its larval host plants, several species of *Cycas*, is known to associate with more than one genera/species of ants. We sampled ornamental *Cycas* plants in urban Delhi infested with *C. pandava* for the genera of ants that associate with the larvae of this butterfly. Results compiled from sampling studies in Delhi, and various reports from literature indicated that at least 13 genera of ants can associate with larvae of *C. pandava*. In the present communication, these results have been discussed in light of the nature of association between *C. pandava* and ants.

Keywords Lycaenid-ant Association, Mutualism

Introduction

The larvae of many Lycaenid butterflies are known to associate with ants- 'myrmecophily' (Pierce *et al*., 2002). The relationship between larvae and ants can be parasitic, commensal or mutualistic (Baylis *et al*., 1993; Fiedler, 2012). The latter type of relationship i.e. mutualism, occurs most frequently (Fiedler, 2006a; 2012). In mutualism, the butterfly larvae provide nutritious secretion-'larval nectar' (rich in sugars and amino acids) from Dorsal Nectary Organs (DNO, located in 7th abdominal segment of larvae) to ants. In return, the larvae are exempted from attack by ants and additionally, ants aggressively safeguard segment which are known to secrete volatile substances, and Pore Cupola Organs (PCO) distributed on abdomen (Pierce *et al*., 2002; Ekka *et al*., 2020). The function of substances secreted from TO is similar to the ant alarm pheromone; it alerts ants when larvae are alarmed, and can communicate the message of need for protection to several species of ants (Pierce *et al*., 2002; Ekka *et al*., 2020). Gnatzy *et al*. (2017) suggested that TO are mechanosensors. PCO is known to secrete substances to appease ants which otherwise may attack soft bodied larvae. Thus, the three organs, i.e. DNO, TO and PCO are important

REVIEW ARTICLE

COVID-19 and Cardiovascular Disease

Clinical Implications of Biochemical Pathways

Varmani, Shivani G[1,#]; Chowhan, Rimpy Kaur[2,#]; Sharma, Ishani[3]; Narang, Rajiv[4]

Author Information

Journal of the Practice of Cardiovascular Sciences 7(2):p 97-107, May–Aug 2021. | **DOI:** 10.4103/jpcs.jpcs_21_21

OPEN

Abstract

Coronavirus disease of 2019 (COVID-19) is a viral pandemic which has taken away more than over 4 million lives all over the world as of July 9, 2021, with the USA, India, and Brazil being the most affected

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(R1513) The Dynamical Study of Variable Mass Test Particle in Nonlinear Sense of Restricted 3-body Problem with Heterogeneous Primaries

Sada Nand Prasad, *Acharya Narendra Dev College, University of Delhi*
Kumari Shalini, *Zakir Hussain Delhi College, University of Delhi*
Abdullah A. Ansari, *International Center for Advanced Interdisciplinary Research (ICAIR)*

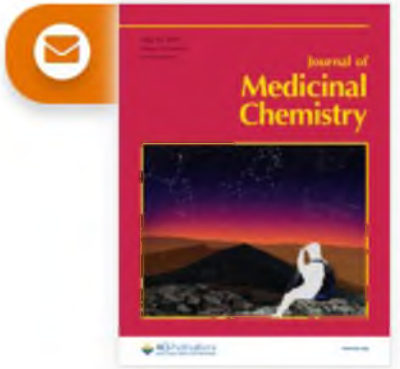
Abstract

The main idea of this paper is to study the non-linear stability property of the motion of the test particle which is moving under the influence of heterogeneous primaries having *N*-layers with different densities as well as varying its mass according to Jeans law. The system is also perturbed by the small perturbations in Coriolis as well as centrifugal forces. We evaluate the equations of motion of the test particle under the influence of the above said perturbations. From this system of equations of motion, we reveal analytically the locations of stationary points as well as the non-linear stability.

Development of Dimethylisoxazole-Attached Imidazo[1,2-*a*]pyridines as Potent and Selective CBP/P300 Inhibitors

Alex Muthengi, Virangika K. Wimalasena, Hailemichael O. Yosief, Melissa J. Bikowitz, Logan H. Sigua, Tingjian Wang, Deyao Li, Zied Gaieb, Gagan Dhawan, Shuai Liu, Jon Erickson, Rommie E. Amaro, Ernst Schönbrunn*, Jun Qi*, and Wei Zhang*

Cite this: *J. Med. Chem.* 2021, 64, 9, 5787−5801
Publication Date: April 19, 2021
https://doi.org/10.1021/acs.jmedchem.0c02232

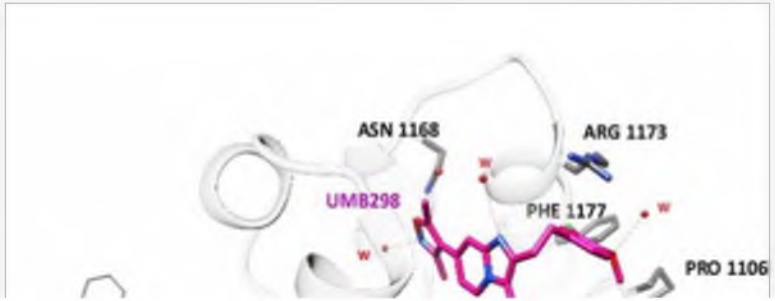


Journal of Medicinal Chemistry

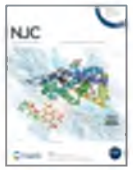
SUBJECTS: Assays, Inhibition, Inhibitors,

Abstract

The use of epigenetic bromodomain inhibitors as anticancer therapeutics has transitioned from targeting bromodomain extraterminal domain (BET) proteins into targeting non-BET bromodomains. The two most relevant non-BET bromodomain oncology targets are cyclic AMP response element-binding protein (CBP) and E1A binding protein P300 (EP300). To explore the growing CBP/EP300 interest, we developed a highly efficient two-step synthetic route for dimethylisoxazole-attached imidazo[1,2-*a*]pyridine scaffold-containing inhibitors. Our efficient two-



Issue 3, 2021



From the journal:
New Journal of Chemistry

Ex vivo binding studies of the anti-cancer drug noscapine with human hemoglobin: a spectroscopic and molecular docking study†

Heerak Chugh,[a] Pramod Kumar,[b] Neeraj Kumar,[a] Rajesh K. Gaur,[c] Gagan Dhawan[d] and Ramesh Chandra[*a]

Author affiliations

Abstract

Noscapine is a non-narcotic alkaloid known to display anti-cancer activity against a wide variety of tumors. Since plasma proteins play the central role in drug transport and targeting, herein we study the binding of noscapine hydrochloride (Nos) with human hemoglobin (Hb), a naturally encapsulated transport molecule. The molecular and biophysical basis of Nos–Hb binding has been investigated by using UV-vis, fluorescence spectroscopy, circular dichroism (CD) and computational methods. The Benesi–Hildebrand binding constant (K_b) and Stern–Volmer constant (K_{SV}) were determined to be 150 M^{-1} and 5.31 × 10^3 M^{-1}, respectively. The biomolecular-quenching constant (K_q), 1.06 × 10^{12} M^{-1} s^{-1}, indicated a rather static quenching mechanism and negative value for free energy (ΔG −12.5 kJ M^{-1}) which

Supplementary files

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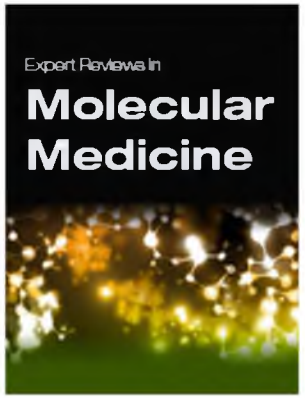

Expert Reviews in Molecular Medicine

Article contents

Targeting unfolded protein response: a new horizon for disease control

Published online by Cambridge University Press: **04 March 2021**

Madhu Khanna, Nishtha Agrawal, Ramesh Chandra and Gagan Dhawan

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Abstract

Unfolded protein response (UPR) is an evolutionarily conserved pathway triggered during perturbation of endoplasmic reticulum (ER) homeostasis in response to the accumulation of unfolded/misfolded proteins under various stress conditions like viral infection, diseased states etc. It is an adaptive signalling cascade with the main purpose of relieving the stress from the ER, which may otherwise lead to the initiation of cell death via apoptosis. ER stress if prolonged,

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Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices

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Res. J.Educational Sci., **Volume 9, Issue (1),** Pages 1-8, August,1 **(2021)**

Abstract
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Abstract

Worldwide Ambient Air Pollution (AAP) has been identified as a major hazard to all living beings covering the entire gamut from cities enveloped in smog to non-discernible polluted air inside homes and that are known to bring a negative influence on health and climate. World Health Organization (WHO) in its global report of 2019 attributed 7 million deaths to Air Pollution, both household (HAP) and AAP. In the scathing report while 3.8 million deaths were ascribed to inefficient fuel burning and dirty cook

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Pressure Ionization, Polarizability and Screening Constants in Confined Hydrogen Like Ions of Astrophysical Importance

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materialstoday: PROCEEDINGS

Volume 34, Part 3, 2021, Pages 767-770

Encompassing environment synthesis, characterization and photovoltaic utilization of cadmium sulphide quantum dots

Rahul [a b], Shruti Singh [c], Pramod K. Singh [b], Jitender Paul Sharma [e], Sunanda Kakroo [b], Rakesh Sonker [d], Zishan H. Khan [a]

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Abstract

Semiconductor QDs has been intensively studied to their interesting characteristics both from the views of fundamental research and practical applications. Colloidal quantum dots are grown in solution from precursors. In comparison amongst the quantum dots (QDs) available in the literature, cadmium supplied quantum dots (CdS QDs) are more popular because of their high luminescence, good quantum yield, wide band gap. The most popular method of preparation is hot organometallic precursor route. In this paper, very low cost and efficient CdS-QD has been synthesized using chemical bath method. The prepared CdS QDs are characterized by UV–Vis absorption, photoluminescence (PL), XRD. A quantum dot sensitized solar cell (QDSSC) will be proposed using a synthesized

International Journal of Computer Science Trends and Technology (IJCST) – Volume 9 Issue 5, Sep-Oct 2021

RESEARCH ARTICLE OPEN ACCESS

Reliable Time Slot Allocation Scheme among Mobile Nodes in MANET

Chandra Kanta Samal

Deptt. Computer Science. ANDC, Delhi University,
New Delhi - India

ABSTRACT
The broadcast protocol in MANET is less efficient and cannot guarantee collision free broadcasts due to high mobility of nodes. This article purposes a new slot allocation scheme between mobile nodes to control, collision; it requires 1-hop neighbour information and also the two-hop neighbor's coverage. Each node maintains a local topology of its 2-hop neighbourhood, and only a small subset of 1-hop neighbours forwards this message, which can reduce the possibility of collision, decrease the delay of the broadcast, and improve the throughput of the network. The subset of 1-hop neighbours selected should cover all the 2-hop nodes and it reduces the broadcast storm problem. Simulation results show that reliable time slot allocation among mobile node algorithm is efficient and reachability within the transmission range of the network. It is a collision free, reliable time slot allocation scheme among nodes and minimum time slot forward broadcast up to 2-hop nodes.

Keywords: Broadcast Storm Problem, Slot Allocation, Throughput, Topology, Reachability.

I. INTRODUCTION

In broadcasting, one node sends a packet to any or all other nodes within the network. Efficient broadcasting during a mobile unintended network focuses on selecting a small forward node set while ensuring broadcast coverage. Due to high mobility and dynamism in mobile ad hoc network, a collision occurs. Within the multi - hop environment, mobile nodes depend to each other's when they are transmitted. It is a distributed network, nodes frequent connectivity changes, due to mobility of nodes and high demand for channel access protocols. Mobile node's transmission on broadcast using omnidirectional antennas, then broadcast service available in mobile ad hoc network. The initial slot assignments between mobile nodes to make a frame schedule on that time collision occur, when new link detects for joining or removes the network in that case again the initial slot assignments. Many transmission scheduling protocols are proposed to improve the channel efficiency [3]. This research paper, we propose the Reliable Time Slot Allocation Among Mobile Nodes (RTSAAMN) algorithm using in Mobile Ad hoc Network. This algorithm involves a minimum time slot; it reduces collisions on the network and their network bandwidths of channels

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RESEARCH ARTICLE

JOURNAL OF MEDICAL VIROLOGY WILEY

Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population

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Abstract

Vaccines against COVID-19 provide immunity to deter severe morbidities associated with the infection. However, it does not prevent infection altogether in all exposed individuals. Furthermore, emerging variants of SARS-CoV-2 impose a threat concerning the competency of the vaccines in combating the infection. This study aims to determine the variability in adverse events and the extent of breakthrough infections in the Indian population. A retrospective study was conducted using a pre-validated questionnaire encompassing social, demographic, general health, the status of SARS-CoV-2 infection, vaccination, associated adverse events, and breakthrough infections in the Indian population. Informed consent and ethical approval were obtained as per Indian Council of Medical Research (ICMR) guidelines. Participants, who provided the complete information, were Indian citizens, above 18 years, and if vaccinated, administered with either Covishield or Covaxin, were considered for the study. Data have been compiled in Microsoft Excel and analyzed for statistical differences using STATA 11. The responses from 2051 individuals fulfilling the inclusion criteria were analyzed. Among 2051, 1119 respondents were vaccinated and 932 respondents were non-vaccinated. Among 1119 vaccinated respondents, 7 were excluded because of missing data. Therefore, out of 1112 vaccinated, 413 experienced adverse events with a major fraction of younger individuals, age 18–40 years, getting affected (74.82%; 309/413). Furthermore, considerably more females than males encountered adverse consequences to vaccination ($p < 0.05$). Among vaccinated participants, breakthrough infections were observed in 7.91% (88/1112; 57.96% males and 42.04% females) with the older age group, 61 years and above (odds ratio, 3.25 [1.32–8.03]; $p = 0.011$), and males were found to be at higher risk. Further research is needed to find the age and sex-related factors in determining vaccine effectiveness and adverse events.

J. Integr. Sci. Technol. 2022, 10(2), 61-66 Article

Journal of Integrated
SCIENCE & TECHNOLOGY

Association of Gender, Age, and Comorbidities with COVID-19 infection in India

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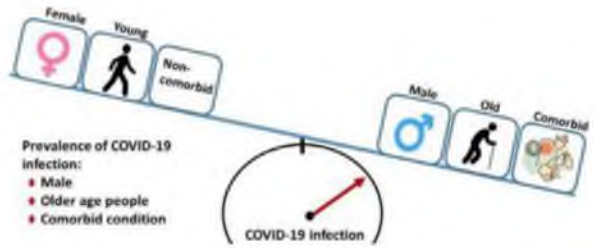
ABSTRACT



Due to a lack of data on various parameters with COVID-19 in the Indian population, this study was carried out to understand the relation among gender, age and comorbidities in Indian population. The data was collected using a questionnaire-based survey form that included questions on demographic characteristics, infection and any pre-underlying conditions (n=1146). The data showed that the male patients had suffered more from COVID-19 (58.6%). Also, the patients suffering from comorbidity are more likely to suffer from a severe form of COVID-19 and obesity/overweight was identified as the most prevalent (n=69) comorbid condition, followed by diabetes (n=35), thyroid (n=19) and hypertension (n=11). In severe COVID-19 cases, 85% of patients had a comorbid condition. In another study of COVID-19 hospitalized-cases, about 97% of patients were found to have an underlying medical condition. Among these, diabetes (55.9%) was identified as the most prevalent comorbidity. Males and older people are at a higher risk of developing COVID-19 infection in Indian population. The comorbid conditions also predisposed individuals to COVID-19 and aggravated the infection.

Keywords: COVID-19, comorbidity, age, gender, obesity, diabetes, hypertension

INTRODUCTION

15 December 2021, it has affected about 270 M people worldwide,

Hesitancy and Acceptance of COVID-19 Vaccination Amidst the Second Wave of Pandemic in India: A General Population Study

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2022, Vol. 34(4) 446–449

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Introduction

Currently, with Delta, Omicron, and other variants on a rampage across the world, it is imperative to get vaccinated in time to curtail the burden of COVID-19 pandemic. The SARS-CoV-2 pandemic was devastating in India, infecting more than 34 million people and 4 million mortality as on December 22, 2021.[1] India is the second densest country with a population of more than 1.3 billion posing a challenge for COVID-19 vaccination.[2] In order to accelerate the pace of vaccination, the Government of India adopted an aggressive "Covid-19 Vaccine Communication Strategy" with the key elements being advocacy, capacity building, media, and social media engagement, social mobilization, community

Results

Demographic Profile of Respondents

A total of 2051 Indians participated in the online and offline surveys with a higher representation of respondents aged 18 to 40 years (70.9%), 41 to 60 years (23.8%), and 61 years and above (5.3%). Gender was found to be almost equally distributed among respondents. About 37.7% were academicians followed by professional and managerial occupations (32.3%) and frontline workers (15.7%). Of note, about 37.1% of the study participants had experienced COVID-19.

Basic Characteristics of Vaccine Hesitancy (VH)

Bioorganic & Medicinal Chemistry
Volume 69, 1 September 2022, 116886

Bioreducible polyethylenimine core–shell nanostructures as efficient and non-toxic gene and drug delivery vectors

H. Jena [a b], Z. Ahmadi [b c], P. Kumar [b], G. Dhawan [a d]

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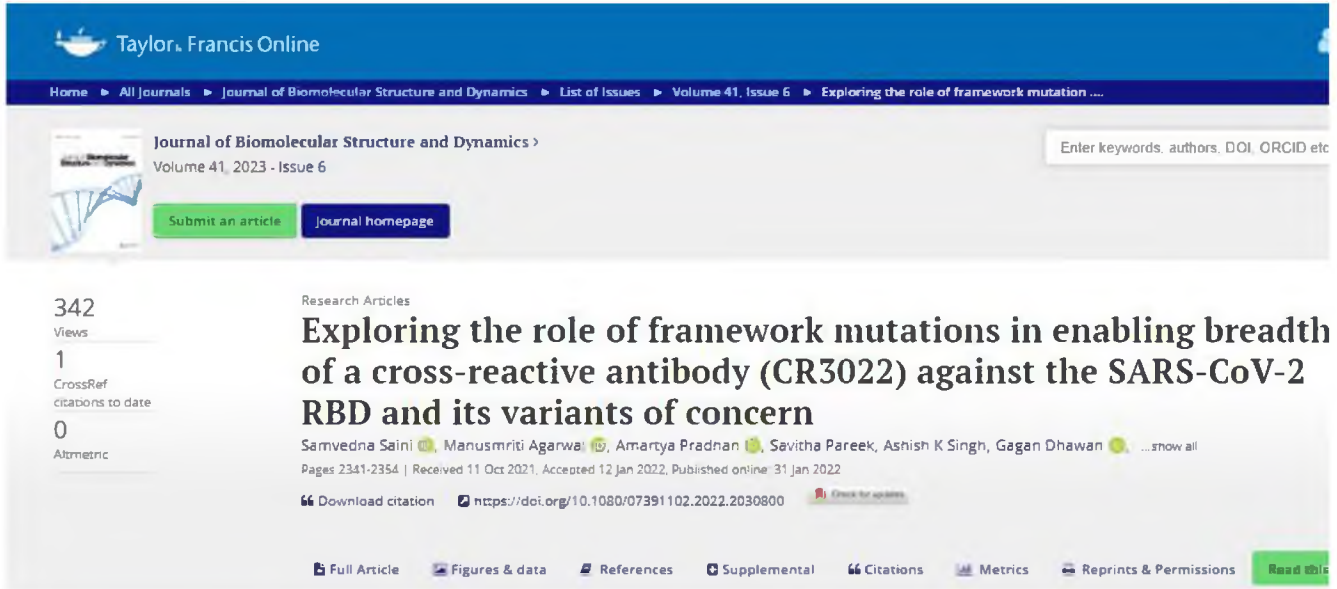
Abstract

Low molecular weight branched polyethylenimine (LMW bPEIs 1.8kDa) have received considerable attention for the fabrication of nucleic acid carriers due to their biocompatible and non-toxic nature. However, due to the inadequate nucleic acid complexation ability and transportation across the cell membrane, these show poor transfection efficacy, limiting their clinical applications. Therefore, to overcome these challenges, in this study, we have grafted bPEI 1.8kDa with a disulfide bond containing hydrophobic moiety, 3-(2-pyridyldithio) propionic acid (PDPA), via amide linkages through EDC/NHS-mediated coupling to obtain N-[3-(2-pyridyldithio)] propionoyl polyethylenimine (PDPP) conjugates. The best formulation for nucleic acid transfection was evaluated after preparing a series of PDPP conjugates by varying the amount of PDPA. In an aqueous environment, these PDPP conjugates self-assembled to form spherical shaped core–shell PDPP nanostructures with size ranging from ~188–307 nm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Exploring the role of framework mutations in enabling breadth of a cross-reactive antibody (CR3022) against the SARS-CoV-2 RBD and its variants of concern
Samvedna Saini, Manusmriti Agarwal, Amartya Pradhan, Savitha Pareek, Ashish K Singh, Gagan Dhawan ...show all
Pages 2341-2354 | Received 11 Oct 2021, Accepted 12 Jan 2022, Published online: 31 Jan 2022
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Abstract
Cross-reactive and broadly neutralizing antibodies against surface proteins of diverse strains of rapidly evolving viral pathogens like SARS-CoV-2 can prevent infection and therefore are crucial for the development of effective universal vaccines. While antibodies typically incorporate mutations in their complementarity determining regions during affinity maturation, mutations in the framework regions have been reported as players in determining properties of broadly neutralizing antibodies against HIV and the Influenza virus. We propose an increase in the cross-reactive potential of CR3022 against the emerging SARS- CoV-2 variants of concern through enhanced conformational flexibility. In this study, we use molecular dynamics simulations, *in silico* mutagenesis, structural modeling, and docking to explore the role of light chain FWR mutations in CR3022, a SARS-CoV anti-spike (S)-protein antibody cross-reactive to the S-protein receptor binding domain of SARS-CoV-2. Our study shows that single substitutions in the light chain framework region of CR3022 with conserved epitopes across SARS-CoV strains allow targeting of diverse antibody epitope footprints that align with the epitopes of recently-categorized neutralizing antibody classes while enabling binding to more than one strain of SARS-CoV-2. Our study has implications for rapid and evolution-based engineering of broadly neutralizing antibodies and reaffirms the role of framework mutations in effective change of antibody
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Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites

Vipin Malik, Laishram Saya, Drashya Gautam, Shallu Sachdeva, Neelu Dheer, Dinesh Kumar Arya, Geetu Gambhir & Sunita Hooda

Polymer Bulletin **79**, 9267–9302 (2022) | Cite this article

Abstract

Large-scale industrialization and urbanization have led to such an alarming level of water contamination throughout the world that wastewater management has become one of the major global challenges attracting much research attention in recent times. Various techniques have been adopted for the treatment of polluted water among which adsorption has been preferred on a larger scale by virtue of its ease and cost-effective nature. This review highlights the efficiency of tamarind-based nanocomposites as potential adsorbents for a varying range of harmful organic and inorganic water pollutants including metal ions, fluoride ions and numerous kinds of dyes. A comprehensive analysis of fabrication routes, adsorption isotherms, kinetic and thermodynamic modeling as well as the adsorption mechanism and recyclability of these adsorbents is being presented in this work. In addition, various factors affecting the adsorption behavior such as pH, amount of adsorbent, concentration of ion/dye and influence of contact time are being elaborately outlined. The comparison of different composites on the basis of their effectiveness, selectivity, economic and environmental aspects has also been outlined. Moreover, a brief comparison of tamarind-based nanocomposites with

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A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions

GEETU GAMBHIR[1], DRASHYA GAUTAM[1], LABHIRAM SAYA[1,2,3], AMIT KUMAR[1], SUBODH KUMAR[1], AARUSHI SINGH[4], SNIGDHA SINGH[4], RAMESH CHANDRA[4,*] and SUNITA HOODA[1,*]

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A new polymeric membrane sensor for Cd(II) ion based on methyl acrylate-acrylonitrile-methyl methacrylate terpolymer as membrane carrier has been synthesized *via* atom transfer radical polymerization (ATRP) method at 60 °C. Preliminary investigation with the membrane exhibited promising selectivity for Cd(II) ion with a slope of 32.02 mV/decade and the same could be estimated in the concentration range of $1 \times 10^{-6} - 1 \times 10^{-1}$ M in the working pH range of 4-6 for up to 90 days. The potentials generated across the membrane were reproducible and the response time was less than one minute. The electrode works well even in a partially non-aqueous media. The effect of surfactant and detergent on the working of Cd(II) selective electrode was also studied. A decrease in potential was observed in the presence of appreciable amount of surfactant and detergent. Addition of plasticisers was found to greatly improve the performance of membrane, best results being obtained with the membrane ratio (NaTPB:TP:TBP::1:100:06), exhibiting a working concentration range of $1 \times 10^{-6} - 1 \times 10^{-1}$ mol L^{-1} with a short response time of 10 s. The proposed sensor shows significantly good selectivity toward Cd(II) ion in comparison with some alkali, alkaline earth, transition and heavy metal ions. It was successfully employed as an indicator electrode in potentiometric titration of cadmium(II) ions against EDTA solution.

Keywords: Methyl methacrylate, Terpolymer, Sensor, Cadmium(II), Ion selective electrode, Membrane.

INTRODUCTION

In recent times, there has been an unwanted accumulation of heavy metal ions in the environment due to their utilization on a wide scale in various activities such as agricultural, technological and industrial applications, *etc*. This has posed a serious threat to the eco-system, particularly human beings [1,2]. Amongst all heavy metals, cadmium is attracting much concerning attention as it is one of the most toxic metals associated with serious health effects. Cadmium is present in its inorganic form in phosphate rocks. However, huge amount of cadmium is introduced into the environment due to widespread use of phosphate fertilizers as well as from the waste effluents of industries like electroplating, smelting, alloy manufacturing, pigments, plastic, battery, mining and refining processes [3-5]. Chronic exposure to cadmium can cause adverse health problems such as destruction of the red blood cells, high blood pressure, damage to kidney, lungs and liver, *etc*. [6,7]. Cadmium is also known to cause severe joint and spine pain due to osteomalacia, osteoporosis and itai-itai disease as cadmium potentially interferes with mineralization of bone [8,9]. Cadmium is even declared a carcinogen [10]. The daily permissible limit for cadmium intake from various sources is 1.0-1.2 μg/g of human body weight as recommended by food scientists. According to the guidelines of United States Environmental Protection Agency (USEPA), the maximum cadmium content in drinking water is 5 ppb [11]. In this scenario, detection of cadmium content in water sources has become very important so that subsequent actions can be implemented for its removal or reducing to the minimal permissible level.

A new polysaccharide-based ion-exchange resin for industrial wastewater treatment

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DOI: dx.doi.org/10.14314/polimery.2022.5.4

Abstract: A new ion-exchange resin was obtained by incorporating a tripropylamine group into a tamarind polysaccharide resin (TTA). The TTA resin was characterized by FTIR, elemental analysis, and other physicochemical properties. The influence of pH, treatment time and resin concentration on the adsorption of metal ions from industrial wastewater was investigated. It was found that the obtained TTA resin effectively removes heavy metal ions in the following order: Fe^{2+}> Cu^{2+}> Zn^{2+}> Cd^{2+}> Pb^{2+}.

Keywords: industrial wastewater, tamarind, tripropylamine, ion-exchange resin, adsorption, flocculants.

Nowa żywica jonowymienna na bazie polisacharydów do oczyszczania ścieków przemysłowych

Streszczenie: Nową żywicę jonowymienną otrzymano poprzez wbudowanie grupy tripropyloaminowej do żywicy polisacharydowej tamaryndowca (TTA). Żywicę TTA scharakteryzowano za pomocą FTIR, analizy elementarnej i innych właściwości fizykochemicznych. Zbadano wpływ pH, czasu obróbki i stężenia żywicy na adsorpcję jonów metali ze ścieków przemysłowych. Stwierdzono, że żywica TTA skutecznie usuwa jony metali ciężkich w następującej kolejności: Fe^{2+}>Cu^{2+}>Zn^{2+}>Cd^{2+}>Pb^{2+}.

Słowa kluczowe: ścieki przemysłowe, tamaryndowiec, tripropyloamina, żywica jonowymienna, adsorpcja, flokulanty.

In India ground water is used for domestic as well as agricultural purposes. Heavy metals ions such as iron, cobalt, cadmium, lead, mercury, chromium, selenium, arsenic, copper and zinc are invariably present in groundwater.These metal ions are considered to be toxins when they enter inside the body exceeding the prescribed limit, wherein they start causing illness [1–3]. Some of the heavy metal ions such as iron, cobalt, cadmium, lead, mercury, Zn^{2+}, Cd^{2+}, Pb^{2+} have extensive applications in electronic appliances such as LED, Mobile phones, and other devices due to their chemical, electrical, optical and magnetic values [5]. Growing demand for reduction of metal ions in water has enhanced the strive for development of feasible ways to remove harmful metal ions from industrial contaminated water. Environmentally friendly adsorbents have been investigated for preferential adsorption

Article

Assessment of Groundwater Quality for Drinking and Irrigation Use in Gurugram Block of Gurugram District, Haryana, India

May 2022 · Asian Journal of Chemistry 34(6):1555-1564 · Follow journal
DOI: 10.14233/ajchem.2022.23779

Vijay Laxmi · Jakir Hussain · Idris Husain · Geetu Gambhir

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Abstract

Groundwater is a vital and reliable source of water in all climates worldwide. In this work, a total of 26 groundwater samples were collected from the Gurugram Block of Gurugram District (a cosmopolitan city situtated proximately to capital of India) analyzed for electrical conductivity, pH, hardness, dissolved solids (TDS), Na+, K+, Ca2+, Mg2+, Cl- and alkalinity as HCO3 −, CO3 2−. Based on the analytical results, the sodium adsorption ratio, sodium percentage, residual sodium carbonate, chloro-alkaline index, base exchange index, meteoric genesis index, permeability index), magnesium hazard and Kelly index were calculated. The most abundant cations were Na+ and Ca2+, which accounted for 43% and 36% of total cations, respectively. Based on median value, the cations are in the following order: Na+ > Ca2+ > Mg2+ > K+. There are no dangers in any of the 22 villages (85%). They have fluoride levels which are less than the maximum desirable limit of 1.0 mg/L established by IS: 10500, 2012. There were 15 villages

Polycyclic Aromatic Compounds
Volume 43, Issue 4, 2022, Pages 2908-2919

Research Article
Research Articles

A DFT Study on Diels-Alder Reaction of Dibenzazepine and 2,5-Dimethylfuran Using Different Solvents and Temperature Conditions

Shilpa Yadav [a], Neeti Misra [b], Pankaj Khanna [b], Mansi [a], Kriti Batra [a], Leena Khanna [a]

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https://doi.org/10.1080/10406638.2022.2056622

Abstract

The Diels-Alder reaction involves cycloaddition of dienes and dienophiles to form a six-membered ring. The reaction involves the formation of adduct which can have two possible configurations, viz, endo and exo. For a vast majority of the Diels-Alder reactions, endo is the major adduct. This first ever study focuses on the Diels-Alder reaction between dibenzazepine and 2,5-dimethylfuran depicted by the computational method using Gaussian 16 software at different basis set levels. The formation of adduct is studied under different temperatures in the gas phase and aqueous medium. The kinetically favored endo adduct is preferred at low temperatures as compared to exo adduct. The adduct gets dehydrated further to give tribenzazepine as the final product. The applicability of the reaction is also proved experimentally in absence or presence of

Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy 264 (2022) 120279

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Chromone functionalized pyridine chemosensor for cupric ions detection

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HIGHLIGHTS

- Chromone functionalized pyridine chemosensor was synthesized.
- CD can selectively detect cupric ions with limit of detection 1.2 · 10^{-6} M.
- The binding stoichiometry obtained as 1:2 for CD: Cu^{2+} complex from Job's plot.
- The Schiff base utilized for sensing cupric ions in a variety of spiked samples of water.

GRAPHICAL ABSTRACT

ARTICLE INFO

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Keywords:
3-Formyl chromone
2, 6-Diaminopyridine
Fluorescence
LOD, Binding constant

ABSTRACT

A new Schiff base 2-ethoxy-3-{[(6-{[(2-ethoxy-4-hydroxy-2H-chromen-3-yl)methylidene]amino}pyridine-2-yl)imino]methyl}-2H-chromen-4-ol (**CD**) was synthesized as a result of the condensation of 2,6-diaminopyridine and 3-formyl chromone in 1:2 M ratio and used for cupric ions detection and characterized through FTIR, HRMS and ^{1}H NMR spectral techniques. The sensing capability of Schiff base for cupric ions as compared to other transition metal ions was examined by absorbance and emission studies. A considerable decrease in emission intensity appeared in Schiff base in the case of cupric ions while irrelevant changes were examined for the rest of the ions. The binding stoichiometry was obtained as 1:2 for **CD**: Cu^{2+} complex intended from the job's plot which was confirmed through HRMS spectral technique. DFT calculations were carried for the confirmation of structural relationships and absorption–emission data. The Regression coefficient, Limit of detection, and Association constant were obtained as 98.7%, 1.2 × 10^{-6} M, and 3.26 · 10^4 M^{-1} respectively using Benesi-Hildebrand (B-H) equation. The sensing power of Schiff base **CD** to recognize cupric ions was unaltered by the addition of the rest of metal ions, which was authenticated through interference studies. Schiff base **CD** and its complex with cupric ions were found stable over an extensive time period as revealed by time-reliant studies. The data collected by pH studies revealed that the preferred pH range for detecting cupric ions by Schiff base **CD** was 6 to 11. The Schiff base was finally utilized for sensing cupric ions in a variety of spiked samples of water like canal water, tap water, groundwater, distilled water.

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Chromone derived effective probe for the detection of metal ion (Cu^{2+}) and chemical explosive (p-nitrotoluene)

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ARTICLE INFO

Keywords:
Schiff base CCH
Cupric ions
P-nitrotoluene
Binding constant
LOD

ABSTRACT

A new chromone based Schiff base probe 1,3-bis({[4-oxo-4H-chromen-3-yl]methylidene}amino) urea (**CCH**) has been synthesized in one step by the condensation reaction between 3-formylchromone and carbohydrazide in a 2:1 M ratio. The characterization of **CCH** was done by employing various analytical techniques FTIR, ^{1}H NMR, ^{13}C NMR, HRMS and FESEM. The probe **CCH** showed a naked eye colorimetric response from colourless to yellow for the Cu^{2+} ions with greater selectivity over other metal ions taken for analysis. The binding constant and limit of detection of **CCH** for Cu^{2+} ions were calculated to be $4.5 \times 10^3 M^{-1}$ and 11.4×10^{-7}M, respectively, using UV-Visible titrations. The DFT (Density functional theory) results also confirmed the experimental studies. In addition, **CCH** has shown its applicability for the detection of nitroaromatic compound i.e., p-nitrotoluene (**pNT**). The sensing mechanism of **pNT** was studied by UV-Visible and fluorescence studies. A significant quenching of the emission intensity of **CCH** at 402 nm in the case of **pNT** was noted above other nitroaromatics taken for study. The binding constant and limit of detection for **pNT** were calculated to be $1.2 \times 10^2 M^{-1}$ and 25×10^{-6}M, respectively, using B-H plot. The presence of other nitroaromatics negligibly affects the detection of **pNT** in **CCH** solution, as confirmed by anti-interfering studies. FESEM analysis of **CCH** with **pNT** confirmed the formation of an adduct. The time resolved fluorescence lifetime measurement also ensured the **CCH**-**pNT** adduct formation and the average life time data revealed that the quenching process was dynamic. The **CCH**-**pNT** adduct formation was also validated via DFT studies. Overall results suggested that the Schiff base **CCH** could be an efficient option to detect Cu^{2+} ions colorimetrically and **pNT** by fluorimetrically.

1. Introduction

Schiff bases are compounds having an active imine linkage (C – N) which is prominently responsible for their various applications in several fields [1,2]. Nowadays, Schiff bases are primarily used as colorimetric and optical sensors for the detection of different analytes such as; metal ions, anions, explosives, etc. [3–9]. This is possible because they possess strong binding affinity towards metal ions to form stable complexes [10,11]. Schiff bases are electron-rich compounds, which makes them suitable for the sensing of nitroaromatics (electron-deficient species) by providing an easy electron transfer process from ligand to nitroaromatics [12]. Several chemosensors other than Schiff bases are also known for analyte detection, but Schiff bases are more preferred now days because of their simplicity, high stability, structural flexibility and an easy synthetic route, in addition they produced with a water molecule as a side product only [13,14]. A number of analytical methods have been introduced for the detection of analytes using chemosensors, namely; fluorescence sensing, electrochemical sensing, atomic absorption spectroscopy, inductively coupled plasma-mass spectrometry, surface enhanced Raman spectroscopy (SERS), chemiluminescence, thermal neutron analysis, cyclic voltammetry, high performance liquid chromatography (HPLC), energy-dispersive X-ray diffraction, gas chromatography (GC), [15–20]. Among these methods, colorimetric sensing and optical sensing (UV-Vis and fluorescence) are more suitable because of their cost-effectiveness, easy sample preparation, high selectivity, sensitivity, and rapid detection of analytes, which makes them more useful tools over other techniques. Colorimetric detection is more facile approach as it involves the naked eye detection of the analyte with less equipment [21,22]. Imbalanced consumption of metal ions can cause severe environmental and health issues [23]. As a result, the design and synthesis of sensors for the detection of such ionic species are crucial. Copper is the third most abundant trace element in

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WET CHEMICAL GROWTH OF ONE DIMENSIONAL ZnO FILM

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ABSTRACT

The present work focuses on the growth of ZnO films vertically on indium tin oxide substrate using a wet chemical method. The morphological and structural study of the prepared films confirmed the formation of one-dimensional growth with a polycrystalline single-phase hexagonal wurtzite structure. The computed texture coefficient indicates the c-axis growth of the film. The optical spectra study exhibited a strong and sharp characteristics absorption band. The numerical derivative method and the Tauc plot method for the different transition values have been used to compare energy bandgap calculations.

Keywords: ZnO Film, SEM, XRD, Rietveld Refinement, UV-Visible Spectroscopy, Tauc Plot Method

INTRODUCTION

In the recent era, metal oxide nanostructures showcase many applications in every field that exists, mainly biosensors, solar cells, photocatalysis, bio-imaging, UV-light emitters, piezoelectric transducers, chemical sensors.[1] There are many metal oxide nanostructures existing in nature, out of which ZnO is the most promising nanostructures (nanomaterial) due to its wide bandgap, thermal stability, high electron mobility, conductance variability, etc.[2] According to the literature, these ZnO nanostructures can be subdivided into various categories such as nanodots, nanoflowers, nanowires, nanopores, nanotubes, nanorings, nanorods, etc.[1] Among these, nanorods and nanowires are being extensively used for practical applications, such as nanowires are used for field-effect transistor (FET) devices, nanogenerators, and nanorods are used for heterojunction devices such as varistors, four-probe electrode systems, sensing applications, etc.[3-6] In addition to these applications, ZnO nanorods in the form of films are being used in FET, dye-sensitized solar cells (DSSCs), light emitters, light detectors, biosensors, gas sensors, etc.[7-8] Various methods are reported in the literature for synthesizing these nanorods, such as electrochemical deposition technique, hydrothermal method, sputter chemical deposition, etc.[9-10] However, certain criteria need to be met to use these methods, mainly high reactant concentration, and high reaction temperature. On similar grounds, these processes are complex and expensive. Therefore, the more accessible approach to synthesize ZnO nanorods is by using the wet chemical method due to its easy processing and cost effectiveness.[11-12]

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An *In Silico* investigation for acyclovir and its derivatives to fight the COVID-19: Molecular docking, DFT calculations, ADME and td-Molecular dynamics simulations

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Keywords:
Molecular dynamics simulations
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ABSTRACT

In the present work, we have designed three molecules, acyclovir (A), ganciclovir (G) and derivative of hydroxymethyl derivative of ganciclovir (CH_2OH of G, that is D) and investigated their biological potential against the Mpro of nCoV via *in silico* studies. Further, density functional theory (DFT) calculations of A, G and D were performed using Gaussian 16 on applying B3LYP under default condition to collect the information for the delocalization of electron density in their optimized geometry. Authors have also calculated various energies including free energy of A, G and D in Hartree per particle. It can be seen that D has the least free energy. As mentioned, the molecular docking of the A, G and D against the Mpro of nCoV was performed using iGemdock, an acceptable computational tool and the interaction has been studied in the form of physical data, that is, binding energy for A, G and D were calculated in kcal/mol. It can be seen the D showed effective binding, that is, maximum inhibitions that A and G. For a better understanding for the inhibition of the Mpro of nCoV by A, G and D, temperature dependent molecular dynamics simulations were performed. Different trajectories like RMSD, RMSF, Rg and hydrogen bond were extracted and analyzed. The results of molecular docking of A, G and D corroborate with the td-MD simulations and hypothesized that D could be a promising candidate to inhibit the activity of Mpro of nCoV.

1. Introduction

Drug repurposing is the concept of utilising the FDA-approved drugs for a new problem, infection or illness other than the one for which it was originally approved. These repurposing drugs save the time and money, accelerated their admittance into experimental clinical trials against other diseases. This process involved the activity based on an experimental or computational approach to develop the new employ of a drug for its biological potency [1–3]. COVID-19 is named for coronavirus disease-19 and it can cause a range of illness from common cold to severe respiratory syndrome and also infects other organs of the body. Coronaviruses (CoV) are a family of encapsulated viruses with single-strained RNA and pathogen. In comparison of previously identified SARS-CoV (2002) and MERS-CoV (2013), SARS-CoV-2 or nCoV is a more virulent variant [4–7]. New SARS-CoV has recently received huge attention worldwide and has been declared as a public health emergency of global concern. Repurposing drug like acyclovir is a well-known antiviral drug and was approved for the treatment of infections due to herpes viruses and zoster virus. A clinical research report has been published, showing the acyclovir as a promising drug against the infection due to SARS-CoV-2 [8]. Heidary et al. has reported a study for acyclovir to be a potential candidate against COVID-19 [9]. Acyclo-GTP is a more efficient inhibitor of viral DNA. Ganciclovir and acyclovir have shown good efficacy against cytomegalovirus infection [10]. A case has

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II-VI core/shell quantum dots and doping with transition metal ions as a means of tuning the magnetoelectronic properties of CdS/ZnS core/shell QDs: A DFT study

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ARTICLE INFO

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Quantum dots
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Transition metal ions
Doping

ABSTRACT

This paper examines the alterations in the properties of II-VI Quantum Dots (QDs) when these are coated with a shell made of another material of the same family and investigates the structural, electronic and magnetic properties of doped CdS/ZnS core/shell QDs. The core/shell QDs have been constructed by building the shell over the bare core QD and it is found that this construction of a shell over the bare QD can bring about dramatic changes in its optical properties. On changing the shell by varying either the cation or the anion, substantial variations are brought about in the band gap and electrophilicity. The trend of Fermi energies is more negative for core/shell QDs than for the QDs without a shell, and the value is almost the same for core/shell QDs with the same core. Swapping of the core and the shell materials brings greater stability in the case of shells of the wider band gap materials. Binding energy data demonstrates that the CdS/ZnS, CdSe/ZnSe, CdSe/CdS core/shell systems are more stable than ZnS/CdS, ZnSe/CdSe, CdS/CdSe core/shell systems, respectively. An augmentation in the properties is found on doping the QD with transition metal ions. The binding energies are found to be functions of the kind of dopant as well as the spin multiplicity and account for the stability of one spin state over the others at a specific site of the QD. The most fascinating property that plays a decisive role in the extent work is the introduction of magnetism in core/shell QDs as a result of the entry of unpaired electrons within the CdS/ZnS QDs on doping with transition metal ions. The deviation of the observed magnetic moments from the expected values increases as the dopant is varied from Mn^{2+} to Fe^{2+} to Co^{2+} to Ni^{2+} to Cu^{2+}. Hirshfeld charge analysis shows that the doped ion accepts negative charge from the sulfide ions in the core, with the smallest charge transfer seen in the case of Hg^{2+} ions. As we move from Mn^{2+} to Hg^{2+}, the trend followed for the Hirshfeld charges indicates that the overall charge on the core is lower and that on the shell is higher for all the doped cases in comparison to the undoped CdS/ZnS core/shell QD. The band gap values reveal that the Fe^{2+} doped CdS/ZnS core/shell structures have the smallest band gaps. Hence, we expect that this paper will help researchers to develop a strategy to produce QDs of the anticipated properties for various applications, and transition metal ions can be successfully employed for modification of various magnetoelectronic properties of the host semiconductor for future applications in nanotechnology.

1. Introduction

Recent advances in the synthesis of highly monodisperse nanocrystallites have paved the way for numerous spectroscopic studies assigning the quantum dot (QD) electronic states and mapping out their evolution as a function of size. QDs, due to their reduced dimensions, have very high surface to volume ratios, with roughly 50% of the atoms residing on the surface. Hence, their optical and structural properties are significantly affected by the atoms present on the surface. The presence of atoms on the surface with unsaturated valencies, called surface defects, leads to the generation of surface trap states acting as non-radiative recombination sites, which degrade the fluorescence quantum yield of the QDs [1]. On passivating the QD surface with organic ligands, these trap states get reduced, but still the complete passivation of surface defects does not occur. In order to passivate the surface in a more complete manner, a secondary layer of semiconductor may be

Abbreviations: QDs, Quantum dots; NCs, Nanocrystals; DOS, Density of states; PDOS, Partial density of states; DSPP, DFT-semilocal pseudopotentials.

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Full Length Article

Precisely engineered type II ZnO-CuS based heterostructure: A visible light driven photocatalyst for efficient mineralization of organic dyes

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ARTICLE INFO

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Visible light
Recyclability
Photocatalytic
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Environmental remediation
Core-shell architecture

ABSTRACT

Herein, type-II band alignment of magnetic ZnO/CuS has been achieved by assembling p-type CuS nanoparticles on n-type ZnO heterostructures to accomplish the photocatalytic degradation of two colored cationic dyes, namely, methylene blue (MB) and toluidine blue (TB). The material exhibited excellent photocatalytic efficiency towards MB and TB with 93% and 87.5% degradation in just 16 and 18 min respectively. The efficacy of doped photocatalyst (FSZCS) was found to be 6 times higher than the undoped material (Fe_3O_4@SiO_2@ZnO; FSZ) whereas pristine CuS degraded only 50% of the dye sample under identical conditions. Therefore, the dramatic enhancement of the photocatalytic degradation performance could be attributed to the synergetic effect created by doping CuS over magnetic ZnO nanocomposites which extended the photoresponse of ZnO by driving the entire degradation process under visible light irradiation and also reducing the charge recombination rate. The plausible mechanistic pathway and identification of degradation products was discussed in detail on the basis of scavenger studies as well as GC–MS analysis. Furthermore, the designed catalyst could be recycled and reused up to 5 runs without any significant decrease in its photocatalytic activity. The reported procedure exhibited multiple advances as it proceeded by utilizing renewable household LEDs as power source at room temperature without the use of any additional oxidant under neutral pH conditions thus, paving a strong path towards sustainable, green and responsible chemistry.

1. Introduction

Photocatalytic degradation has surfaced as a burgeoning technique contributing immensely towards environmental remediation via the use of renewable, clean and abundant solar energy [1]. As a green and sustainable approach, it has found numerous applications in the arena of treatment of perilous and toxic effluents such as dyes, pesticides, pharmaceutical by-products, industrial waste etc. A wide range of photo-responsive materials like metal oxides, metal nitrides and oxy-nitrides, alkali metal base, metal sulfides and carbon-based components have been employed for carrying out the degradation of harmful organic pollutants into environmentally benign products [2–6]. Amongst them, metal oxide and sulfide based semiconductors have occupied a central place in the field of environmental reformation owing to their wide band gap due to deep 2p oxygen orbital in their valence band [7,8]. The process is set off by the generation of electrons when light with wavelength lesser than or equal to the band gap of the semiconductor is illuminated in turn separating the charge carriers (electrons and holes). Semiconductors with wide band gap such as TiO_2 and ZnO have invariably proved their worth as dynamic photocatalysts [9–11]. ZnO specifically with a band gap of 3.37 eV has the potential of detoxifying water owing to its prominent reaction and mineralization rates, lower toxicity, economic nature, higher number of active sites and the fact that it can be moulded to obtain various morphologies [12]. Unfortunately, it works best in the UV region, which constitutes less than 5% of the solar energy thus conspicuously confining its photocatalytic utility. Another factor limiting its photocatalytic efficiency is the rapid charge recombination. Therefore, it is indispensable to shift the optical absorption band of ZnO towards the visible range and simultaneously circumvent the issue of charge recombination [13]. One of the simplest yet appealing pathway to overcome this roadblock is by doping such single-component semiconductor with another narrow band gap semiconductor which can synergistically bring the band gap in visible region and ensure prolonged separation of charge carriers [14]. Copious

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Ingeniously designed Silica nanostructures as an exceptional support: Opportunities, potential challenges and future prospects for viable degradation of pesticides

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ARTICLE INFO

Keywords:
Advanced oxidation processes
Mineralization
Pesticides
Photocatalytic degradation
Silica nanostructures
Sustainability

ABSTRACT

Despite significant advancements in modern agricultural practices, efficient handling of pesticides is a must as they are continuously defiling our terrestrial as well as aquatic life. During the last couple of decades, substantial efforts by various research groups have been devoted to find innovative solutions to remove pesticides from our environment in a greener way. In this regard, functionalized silica nanoparticles (NPs) have gained considerable attention of scientific community due to their unique properties such as amenable design, large surface area as well as fine-tunable and uniform pore structures which make them an ideal material for pesticides removal. The present review aims to proffer current scientific progress attained by silica-based nanostructures as an excellent material for effective removal of noxious agrochemicals. Further, a brief discussion on the synthetic strategies as well as intrinsic benefits associated with different morphologies of silica have also been highlighted in this article. It also summarizes the recent reports on silica assisted degradation of pesticides via enzymatic, chemical as well as advanced oxidation protocols. Additionally, it presents a critical analysis of different support materials for decontamination of our ecosystem. The review concludes with potential challenges, their possible solutions along with key knowledge gaps and future research directions for successful deployment of silica supported materials in degradation of pesticides at commercial scale.

1. Introduction

For many decades, population spurt has been a topic of deliberation and preoccupation calling for an immediate action to intensify the global agricultural production to ensure food security. According to the "World Population Prospects 2019", a United Nations (UN) report, world population is further expected to reach 9.7 billion by 2050 (UNSA, 2019). Thus, the ever expanding number of inhabitants stresses on the requirement to boost the crop production without increasing farmland footprint. To enhance crop productivity and make agriculture profitable in face of rising valuation, use of pesticides, herbicides and fertilizers have proliferated exponentially. Pesticides refer to a group of chemical compounds used to kill undesirable organisms in farmlands and have been playing a pivotal role in agronomics since the dawn of agricultural revolution (Rani et al., 2021). According to their usage, pesticides can be classified broadly in four categories namely, herbicides, insecticides, fungicides and rodenticides. Synthetic organic pesticides generally contain carbamates, organophosphates, coumarins, organochlorines, organonitrogens, pyrethroids along with arsenic and mercury derivatives (Rani et al., 2017).

Nevertheless, with the rapid development and proliferation of chemical industries, their indiscriminate and sporadic use has led to 200,000 human deaths annually along with the contamination of natural resources (Nasr et al., 2017). Most of the chemical pesticides are retained within the body of organism because of their lipophilicity and exhibit detrimental effects on human health due to their carcinogenic nature and ability to damage central nervous system (Sallmann et al., 2018). Starting from flora to fauna, pesticides owing to their longer half-lives not only extensively accumulate but also remain persistent in water and soil, thereby posing serious threat to the environment (Fernández-Pérez et al., 2011; Liu et al., 2016a). Another major limitation associated with the use of conventional pesticides is that their

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From the journal:
New Journal of Chemistry

Magnetically separable type-II semiconductor based ZnO/MoO_3 photocatalyst: a proficient system for heteroarenes arylation and rhodamine B degradation under visible light†

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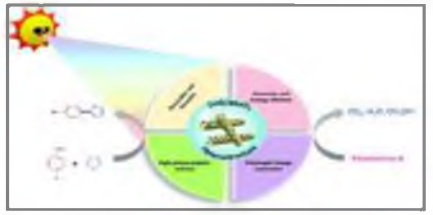
Author affiliations

Abstract

Herein, a new strategy is used to systematically tailor the band arrangement in a ZnO based heterostructure to realize its bifunctionality towards the synthesis of heteroarylated products and degradation of Rhodamine B under visible light. A Type-II band alignment transition is carried out *via* introducing MoO_3 rods which subsequently enhance its light-harvesting properties, prolonged charge separation and abundant active sites. The designed heterostructure displayed broad functional group compatibility for both electron-donating and electron-withdrawing group substituted substrates with good product yield. Comparably, their visible light driven heteroarylation process is significantly enhanced to more than 4 times that of pristine ZnO and is superior to most photocatalysts reported previously. ZnO/MoO_3 also displayed remarkable degradation ability of 96.8% towards RhB into innocuous products under neutral conditions without utilizing any oxidant. More impressively, the developed catalyst demonstrated long-term stability and excellent reusability up to five runs without any significant change in efficiency. Hence, this work not only for the first time exhibits the untapped potential of using a highly active, economically efficient and magnetically separable ZnO/MoO_3 core–shell heterostructure to substitute for expensive metals in photocatalysis but also presents a new opening for synthesising hybrid materials with excellent performance in environmental remediation.



Issue 6, 2022

From the journal:
Dalton Transactions

An Earth-abundant cobalt based photocatalyst: visible light induced direct (het)arene C–H arylation and CO_2 capture†

Pooja Rana,[a] Bhawna Kaushik,[a] Rashmi Gaur,[a] Sriparna Dutta,[a] Sneha Yadav,[a] Pooja Rana,[a] Kanika Solanki,[a] Bhavya Arora,[a] Ankush V. Biradar,[b] Manoj B. Gawande[c] and R. K. Sharma[a]

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Abstract

In this work, we have reported a noble metal free heterogeneous photocatalyst to carry out direct (het)arene C–H arylation and solvent-free CO_2 capture *via* single-electron transfer processes at room temperature and under pressure. The catalytic system comprises a cobalt(III) complex grafted over the silica coated magnetic support for the efficient recovery of the photocatalytic moiety without hampering its light harvesting capability. The novel Earth-abundant cobalt(III) based photocatalyst possesses various fascinating properties such as high surface area to volume ratios, large pore volume, crystalline behaviour, high metal loading, excellent stability and reusability. The general efficacy of the highly abundant and low-cost cobalt based heterogeneous nanocatalyst was checked for the selective conversion of aryldiazonium salts into synthetically and pharmaceutically significant biaryl motifs under ambient conditions upon irradiation with visible light. The highly efficient photocatalytic conversion of carbon dioxide (CO_2) to a value-added chemical was accomplished under mild reaction conditions with high selectivity, showing the added benefit of operational simplicity.

Magnetic Boron Nitride Nanosheets Decorated with Cobalt Nanoparticles as Catalyst for the Synthesis of 3,4-Dihydropyrimidin-2(1*H*)-ones/thiones

Pooja Rana, Ranjana Dixit, Shivani Sharma, Sriparna Dutta, Sneha Yadav, Bhavya Arora, Bhawna Kaushik, Pooja Rana, and Rakesh K. Sharma*

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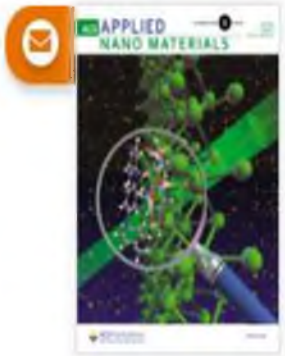


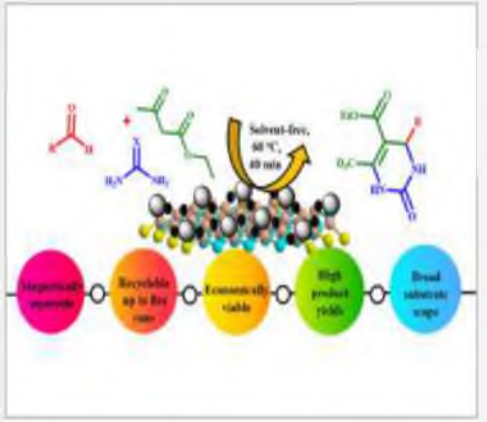
ACS Applied Nano Materials

Read Online | PDF (12 MB) | Supporting Info (1) »

SUBJECTS: Catalysts, Cobalt,

Abstract

Atomically thin two-dimensional boron nitride nanosheets have spawned futuristic advancements in the arena of nanocatalysis research through their intriguing capability to act as exceptional support matrixes. Motivated by their phenomenal attributes, we have fabricated a magnetic boron nitride nanosheet-based cobalt catalytic system wherein boron nitride nanosheets are initially integrated with magnetic Fe_3O_4 nanoparticles (NPs), and the resulting nanostructure is further surface-engineered with cobalt NPs to yield an *h*-BN/Fe_3O_4/Co hybrid. For gaining an insight into their structural and morphological features, reliable spectroscopic and microscopic characterization techniques including TEM, SEM, XRD, FT-IR, VSM, ED-XRF, XPS, BET, TGA, and AAS were employed. The developed nanohybrid material was then utilized to provide ready access to a library of highly bioactive 3,4-dihydropyrimidin-2(1*H*)-ones/thiones under ambient conditions. A plausible mechanistic route for furnishing 3,4-dihydropyrimidin-2(1*H*)-ones catalyzed by *h*-BN/Fe_3O_4/Co has also been delineated. Ambient reaction conditions, solvent-free conditions, high product yield, and excellent thermal and mechanical stability of the catalyst along with facile magnetic retrievability and efficient recyclability are some of the phenomenal characteristics of this methodology. The present protocol besides exhibiting a wider functional group tolerance and a high turnover number was devoid of any additive, thus making it superior to literature precedents reported to date. In consideration of the striking catalytic activity of the *h*-BN/Fe_3O_4/Co nanomaterial, it can be anticipated that the present catalyst can not only possess a stupendous potential to expedite substantial manufacturing of other industrially demanding organic motifs but may also unlock insights for designing next-generation 2D catalytic materials.



KEYWORDS: nanocomposites, heterocyclic motifs, heterogeneous catalytic system, catalytic efficacy, recoverability, recyclability

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New Journal of Chemistry

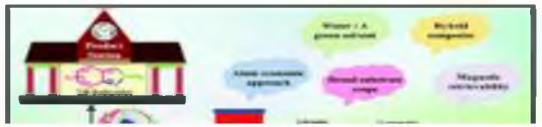
Unravelling the catalytic potential of a magnetic $CoFe_2O_4$/Cu–ABDC MOF composite in the sustainable synthesis of 2*H*-indazole motifs†

Sneha Yadav,[a] Ranjana Dixit,[a] Shivani Sharma,[a] Sriparna Dutta,[a] Bhavya Arora,[a] Pooja Rana,[a] Bhawna Kaushik,[a] Kanika Solanki[a] and Rakesh K. Sharma [a]

Author affiliations

Abstract

Incessant advancements made in catalytic processes during the past few decades prompted researchers to design prodigious sustainable materials that lie within the domain of green synthesis. From this perspective, metal organic frameworks (MOFs) with abundant chemical functionalities and ultra-high chemical as well as structural tunability have emerged as the most prolific heterogeneous catalysts in synthetic organic chemistry. Herein, we report the fabrication of a magnetic $CoFe_2O_4$/Cu–ABDC (ABDC = 2-aminoterephthalate) hybrid composite *via* a one-pot solvothermal strategy whose catalytic efficiency has been investigated in a three-component coupling reaction to obtain biologically active and pharmacologically significant 2*H*-indazole scaffolds (up to 98% yield). By integrating magnetic inverse spinel cobalt ferrite nanoparticles with the functional properties of the MOF, two most important parameters, *i.e.* environmental compatibility and recyclability, have been well established on a single platform. Aided by the advanced microscopic, spectroscopic and property characterization tools, the morphological as well as structural information of the developed hybrid composite has been deduced well. The aim of this study is to design a sustainably viable process that would provide highly demanding pharmacophores, *i.e.* 2*H*-indazoles, in surprisingly high yields from comparatively cheap benchmark substrates – "substituted anilines, 2-bromobenzaldehydes and sodium azide". Furthermore, our protocol has successfully accomplished the remarkable task of replacing toxic volatile organic solvents with eco-friendly solvents such as water. A broad substrate scope, high atom economy, ambient and greener reaction conditions devoid of any ligands, additives or activators, a lower reaction time and temperature, a high turnover frequency and magnetic retrievability are some of the salient features of this methodology which render it highly promising in industry and academia. Besides, the present study is the first report employing a magnetic MOF as a heterogeneous catalyst for the preparation of 2*H*-indazole moieties.



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Review

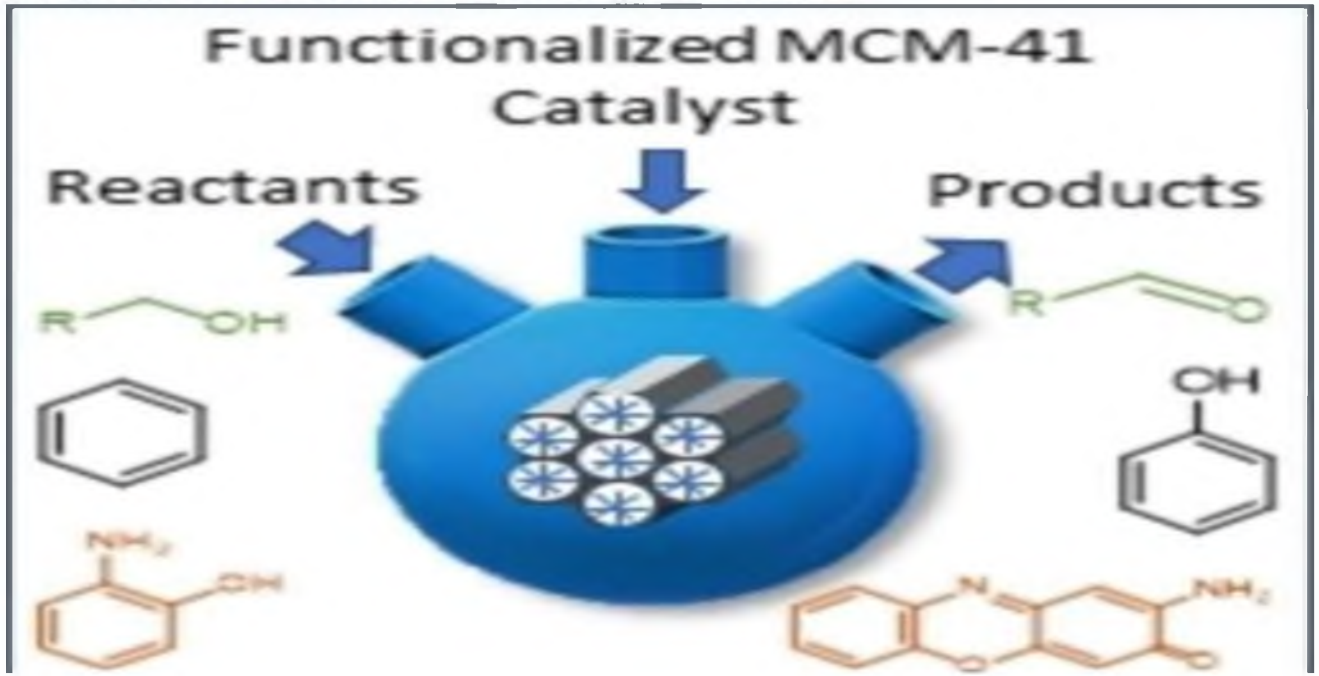
Functionalized MCM-41: Versatile Catalysts for Organic Transformations

Dr. Sharda Pasricha, Dr. Pragya Gahlot, Dr. Kavita Mittal, Devansh Rai, Nishita Avasthi, Harsimar Kaur, Shruti Rai

First published: 17 February 2022 | https://doi.org/10.1002/slct.202103674 | Citations: 7

Graphical Abstract

The scope of seven surface functionalized MCM-41 catalysts in organic transformations discussed. Functionalized MCM-41 are innovative and need based catalyst systems for reactions like Sonogashira, Suzuki, Heck, Aldol, Knoevenagel, Friedel Craft reaction and Pechmann condensation etc. Several other reactions like oxidation, reduction, dehydration, esterification, trans-esterification, epoxidation as well as C–S, C–N, C–O and S–S coupling reactions also possible with MCM-41 based catalysts. Multicomponent synthesis of bioactive heterocycles is reported. Major challenges and future prospects of functionalized MCM-41 catalysts are discussed.



Coupling Fear and Contagion for Modeling Epidemic Dynamics

Publisher: IEEE

Cite This

PDF

Kirti Jain ; Vasudha Bhatnagar ; Sadanand Prasad ; Sharanjit Kaur All Authors

Abstract:

The emotion of fear related to an infectious disease not only influences an individual's behavior but also transmits to social contacts. Therefore, modeling human behavior is a precursor to reliable estimates of epidemic size and duration. In this paper, we present an abstract model of fear, which is realized using an Individual-based Fear Model (IBFM). In this model, fear is coupled with contagion to study the influence of human behavior on epidemic dynamics. Since fear is an inherent characteristic of an individual that determines susceptibility to infection, the model discerns between individuals by maintaining a fear-index . Variations in innate fear levels in populations with cultural differences are also accommodated. Since the fear level of individuals is affected by the changing size of the epidemic, IBFM provides a mechanism to update fear in the population realistically. The mechanism gives rise to multiple epidemic waves observed in real-world epidemics. We compare the epidemic dynamics for IBFM and differential equation-based realization of the abstract model. We present a detailed empirical study to understand the interplay of fear and contagion in IBFM.

Behaviour of motion of infinitesimal variable mass oblate body in the generalized perturbed circular restricted three-body problem

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Abstract. The main goal of the present study is to reveal the behaviour of motion of the infinitesimal body in case of circular restricted three-body problem where all the participating bodies have oblate shapes and both primaries have the effect of solar radiation pressure. The third infinitesimal body is varying its mass according to Jeans law. We also consider that the system is affected by the small perturbations in Coriolis and centrifugal forces. We evaluate the equations of motion of the infinitesimal oblate body under the generalized sense in the perturbed circular restricted three-body problem by using the Meshcherskii-space time transformations to preserve the dimensions of the position as well as time, and then determine the Jacobi-integral. Further we numerically illustrated the equilibrium points, Poincaré surfaces of section, regions of possible and forbidden motion and then basins of the attracting domain by supposing the effects of all the parameters used. Further more, we examine the stability of these

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Study and prediction of prostate cancer using fuzzy inference system

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Keywords:
Fuzzy logic
Fuzzy expert system
Prostate cancer
Prostate specific antigen
Prostate volume
% Free prostate specific antigen

ABSTRACT

The essential driver of passing among men on the planet is prostate disease. In the chief stage, for early identification of the prostate disease by applying Fuzzy Inference System (FIS) has been depicted in this study. The age of the patient, Prostate Volume (PV), % Free PSA (FPSA) and Prostate Specific Antigen (PSA) are utilized as input parameters in FIS for computing the risk factor of the prostate cancer. In this study Mamdani method is used for evaluation and analysis of the Prostate Cancer Risk (PCR). The present FIS additionally required the base estimation decreases horribleness lessens dismalness, mortality and more dependable from other system. It can likewise be considered in medicine to decrease manual assignments and human mistake. This review advocate that, this FIS might consequence on work on the productivity to recognized the distinctive kind of the malignant growths just as lessening the expense of care of the patients.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Materials, Machines and Information Technology-2022

1. Introduction

In the past decades, Egawa et al. [10] used PSA tenders for differentiating prostate carcinoma, Catalona [7] used PSA concentrations for detection of Prostate cancer, Allahverdi, and Yaldiz, [1] developed and design the pre-diagnosis expert system for medicine. Roehrborn et al. [27] investigates the growth of prostate by Serum PSA which was a stronger predictor. Boegla et al. [5] applied fuzzy knowledge to use fuzzy system, while in same time Lascio [18] developed a fuzzy system analysis of diabetic neuropathy. Allahverdi [2], investigates the impact of fuzzy set theory in to numerous medical difficulties with Artificial intelligence which extensively used in various fields including robotics, marketing, medical applications. Numerous expert systems were considered for progress of Fuzzy logic which plays a significant part in medication regions [24] to predict the forecast to treatment with citalopram in liquor dependency [30] to investigate diabetic neuropathy [18]; To investigate the volumes of brain tissue for the MRI to analyse the MRI data [19]; and to investigate the blood pressure by using fuzzy logic. Lu et al. [19] developed fMRI activation detection for image segmentation without supposition of time series. PERSI et al. [25] investigate a fuzzy expert system to diagnosis of prostate cancer by input parameters as PSA (prostate specific antigen) and PV (prostate volume) and PCR (prostate cancer risk) output parameter.

Gawedal, Brier, and Zurada [11,12] developed and used a fuzzy rule-based system to help the doctors who decided about the dose of medicine to treat the 200 dialysis patients. Danaei et al. [8] analysed first time to give cause of cancer and their 12 attributes with nine risk factors. Benecchi [4] developed a fuzzy neuro system which gave good accuracy other than tPSA (total prostate-specific antigen) and %FPSA (percent free PSA) for detection of prostate cancer. Miller et al. [22] has set the limit by using particular PSA value for detection of prostate cancer and discusses their testing. Keles et al. [14] investigates neuro fuzzy system rules for

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2214-7853/
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Selling price, time dependent demand and variable holding cost inventory model with two storage facilities

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ARTICLE INFO

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Available online 1 February 2022

Keywords:
Own Warehouse (OW)
Rented warehouse (RW)
Sensitivity analysis
Holding cost
Multivariable demand

ABSTRACT

Customer service stock-out rates, as well as the company's business sales and marketing productivity, are controlled by the storage facility (warehouse). In this study, a two- storage production inventory model with demand dependent on price and time described. The rate of demand is governed by the selling price and the time. In this analysis, we hypothesized that the deterioration rate is constant and that the holding cost for own storage is time-dependent (OW). For rental storage, the deterioration rate is considered to be time-dependent, while the holding cost is assumed to be constant (RW) which is more realistic. This study assists to reduce total inventory costs by finding the best replenishment strategy. A numerical example is used to demonstrate the model's method, as well as a sensitivity analysis on a few parameters.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Materials, Machines and Information Technology-2022.

1. Introduction

A storage facility (warehouse) is a huge structure where raw supplies or produced substances are kept till; they are exported or dispersed to trade outlets for sale. In recent years, the problem of two storage or two shops inventory models has received a lot of attention in the beginnings of multi-national enterprises. Two storage facility models play an important role for middle-order retail outlets and smaller shops of multinational companies to stay competitive for sale prices. When the price of commodities becomes less than purchasers can purchase quantities in bulk so it becomes important to purchasers to keep this extra stock in the storage house (warehouse).

Several scholars have addressed a variety of two-warehouse inventory models throughout the previous two decades. Hartley [9] was the first to suggest this type of system. They assumed that the holding cost of RW was higher than that of OW in that scenario. Sarma [20] investigated inventory model of two storage facilities and having an optimum release rule and extend the Hartly model by considering the cost of transportation. Murdeshwar and Sathe (1985) developed lot size two shop model and consider the rate of production fixed. Sarma [21] and Benkherouf [1] investigated an order level deterministic model with two warehouses and consider the preserving capacities in a leased warehouse were higher for those who kept goods in own warehouse. Dave [4] modified the model of Sarma [20]. Sarma [22] extended and investigated the two shop model developed by Dave [4] under effect of two new parameters. Goswami and Chaudhuri [8] developed a linear trend of demand an EOQ model with two storage facilities for worsening items.

Pakkala and Achary [16] developed two shop model dependent on discrete time and Pakkala and Achary [17] generated release rule for warehouse or storehouse when purchaser purchased deteriorating goods in bulk. Bhunia and Maiti [2] extended a two shops model in which Stock level reliant on the rate of consumption. Bhunia and Maiti [3] modified and devolved two shop model for decaying products by considering continuous release rule for transferring goods from shops. Wu [25] investigated a two shops model by considering a demand function constant as well as deter-

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TWO WARE-HOUSES FUZZY INVENTORY MODEL FOR DETERIORATING ITEMS WITH RAMP TYPE DEMAND AND SHORTAGES

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Ajay Singh Yadav, SRM Institute of Science and Technology, Delhi-NCR Campus
Chaman Singh, Acharya Narendra Dev College

ABSTRACT

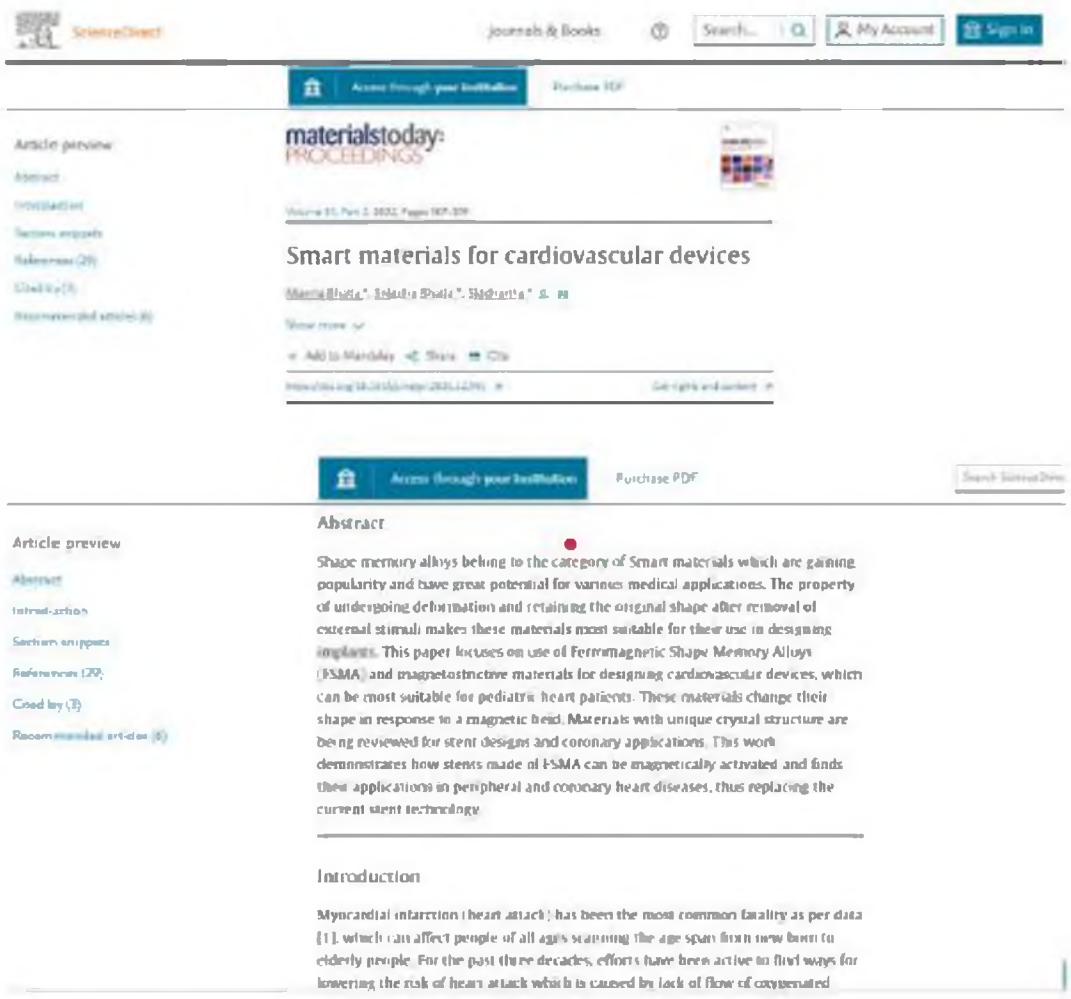
In this paper we developed a fuzzy inventory model for single spoilage two-parameter weibull-distribution degradation rate, ramp type demand, and partial backordering at a constant rate. In the current market scenario, an increase in the cost of the inverter affecting the total cost of inventory costs due to inflation can increase at any time of the order length.The increase in the cost of the components of the inventory cannot be pre-determined due to the uncertainty of the market situation. Therefore, we have considered the interval based fuzzy concept to handle the uncertainty condition. Ordering cost, the cost of holding in both ware-houses is considered a triangular fuzzy number.

Keywords: Weibull deterioration distribution; Partial backlogging; Rramp type demand; Fuzzy holding cost; Ordering cost.

INTRODUCTION

In traditional models, many researchers have considered the rate of demand to be constant, linear time dependent, stock dependent or accelerating over time and the same trend of considering this type of demand still continues but it is not always true that demand occurs in the same pattern. The assumption of a constant demand rate is generally valid in the mature phase of a product's life cycle. Several models have developed inventory models for items stored in two ware-houses under modelling assumptions. The rate of demand in these models is assumed to be constant over time. However, in practice a person will accept the demand for separation over time.Most classical inventory models assumed that the utility of the inventory remains constant during the period of their storage. But in real life, degradation occurs during the storage period. The deterioration of physical objects is a common phenomenon in the real world that can occur for various reasons and has attracted a lot of attention from various researchers.In recent years, the problem of inventory worsening has received considerable attention. Most products such as medicine, blood, fish, alcohol, gasoline, vegetables, and radioactive chemicals have self-life, and once spoiled they begin to deteriorate. The listed researchers, above, have taken care of deteriorating objects in their models and have developed models accordingly. In addition to inventory deterioration, limited storage is also a major practical problem for real life.Due to lack of large storage space at important market places, one should be forced to own a small ware-

Citation Information: Sethi, G., Yadav, A. S., & Singh, C. (2022). Two ware-houses fuzzy inventory model for deteriorating items with ramp type demand and shortages. *Journal of Management Information and Decision Sciences, 25*(2), 1-22.



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Abstract

Shape memory alloys belong to the category of Smart materials which are gaining popularity and have great potential for various medical applications. The property of undergoing deformation and retaining the original shape after removal of external stimuli makes these materials most suitable for their use in designing implants. This paper focuses on use of Ferromagnetic Shape Memory Alloys (FSMA) and magnetostrictive materials for designing cardiovascular devices, which can be most suitable for pediatric heart patients. These materials change their shape in response to a magnetic field. Materials with unique crystal structure are being reviewed for stent designs and coronary applications. This work demonstrates how stents made of FSMA can be magnetically activated and finds their applications in peripheral and coronary heart diseases, thus replacing the current stent technology.

Introduction

Myocardial infarction (heart attack) has been the most common fatality as per data [1], which can affect people of all ages spanning the age span from new born to elderly people. For the past three decades, efforts have been active to find ways for lowering the risk of heart attack which is caused by lack of flow of oxygenated

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ENERGY STORAGE

SPECIAL ISSUE ARTICLE

Studies on energy storage properties of BFO/WO_3 bilayer thin film capacitor

Shiva Sakhuja, Savita Sharma, Monika Tomar, Anil Chowdhuri

First published: 05 April 2022 | https://doi.org/10.1002/est2.342 | Citations: 1

Funding information: Department of Science and Technology, New Delhi, India

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Abstract

Present work reports the growth of BFO/WO_3 bilayer thin film structures over Silicon, corning and ITO coated glass substrates. BFO layer in BFO/WO_3 bilayer structure was deposited using Pulsed Laser deposition (PLD) technique at optimized laser energy (200 mJ) while WO_3 nanostructured layer was deposited using rf-magnetron sputtering technique at varying glancing angle from 65° to 80°. For the realization of MBM (metal-bilayer-metal) device, top Gold (Au) electrodes have been deposited using thermal evaporation technique. The BFO/WO_3 bilayer structure fabricated at 70° glancing angle exhibited the saturation (P_s) and remnant (P_r) polarization as 45.45 μC/cm^2 and 21.52 μC/cm^2 respectively, which are appreciably higher than the earlier reports for pure BFO thin films. Enhanced energy storage characteristics were obtained in Au/BFO/WO_3/ITO structure fabricated at 70° glancing angle with charge-discharge efficiency (63%) and enlarged recoverable energy density (467 mJ/cm^3). Achieved results indicate the utilization of fabricated Au/BFO/WO_3/ITO structures towards high energy storage applications.

Open Research

REFERENCES

Volume 5, Issue 3

Special Issue: Special Issue on "Progress in Advanced Energy Storage Materials"

March 2023

e342

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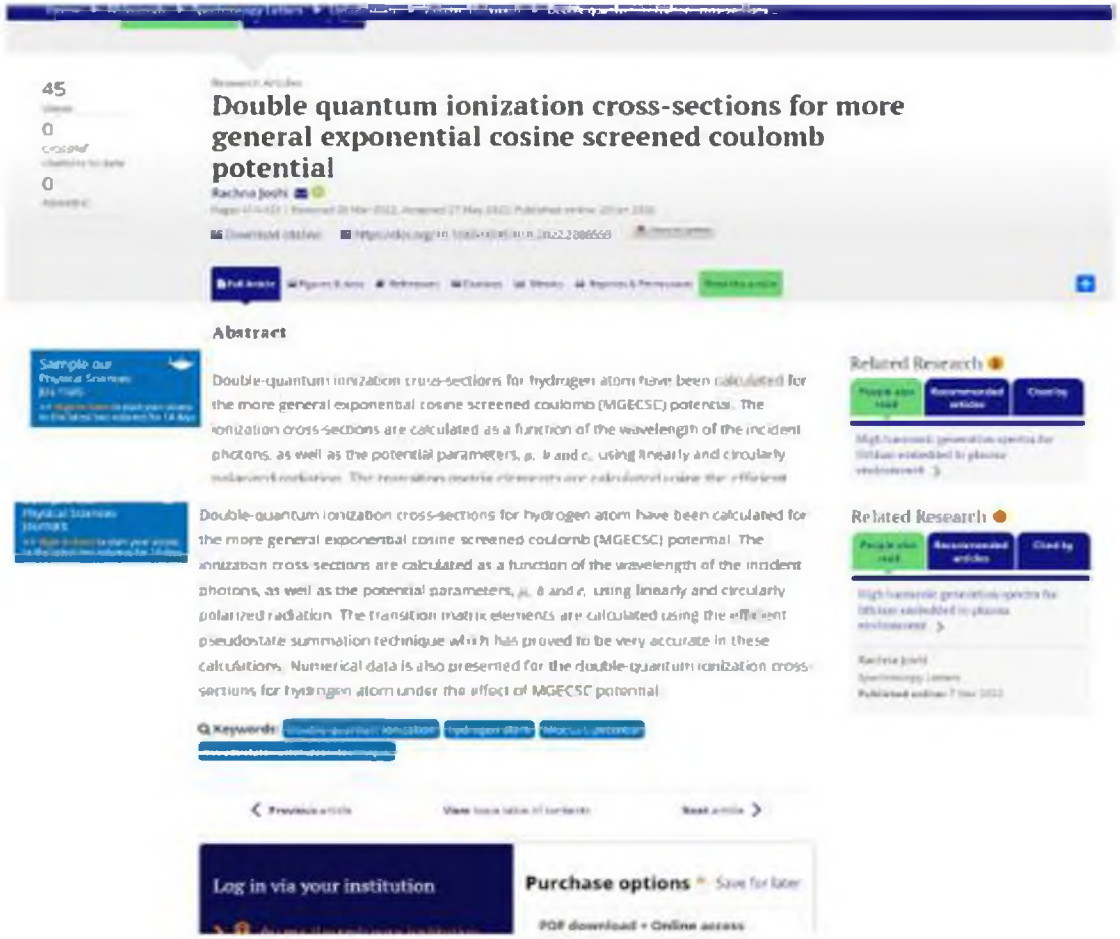

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Double quantum ionization cross-sections for more general exponential cosine screened coulomb potential

Rachna Joshi

Abstract

Double-quantum ionization cross-sections for hydrogen atom have been calculated for the more general exponential cosine screened coulomb (MGECSC) potential. The ionization cross-sections are calculated as a function of the wavelength of the incident photons, as well as the potential parameters, α, δ and c, using linearly and circularly polarized radiation. The transition matrix elements are calculated using the efficient pseudostate summation technique which has proved to be very accurate in these calculations. Numerical data is also presented for the double-quantum ionization cross-sections for hydrogen atom under the effect of MGECSC potential.

Double-quantum ionization cross-sections for hydrogen atom have been calculated for the more general exponential cosine screened coulomb (MGECSC) potential. The ionization cross-sections are calculated as a function of the wavelength of the incident photons, as well as the potential parameters, α, δ and c, using linearly and circularly polarized radiation. The transition matrix elements are calculated using the efficient pseudostate summation technique which has proved to be very accurate in these calculations. Numerical data is also presented for the double-quantum ionization cross-sections for hydrogen atom under the effect of MGECSC potential.

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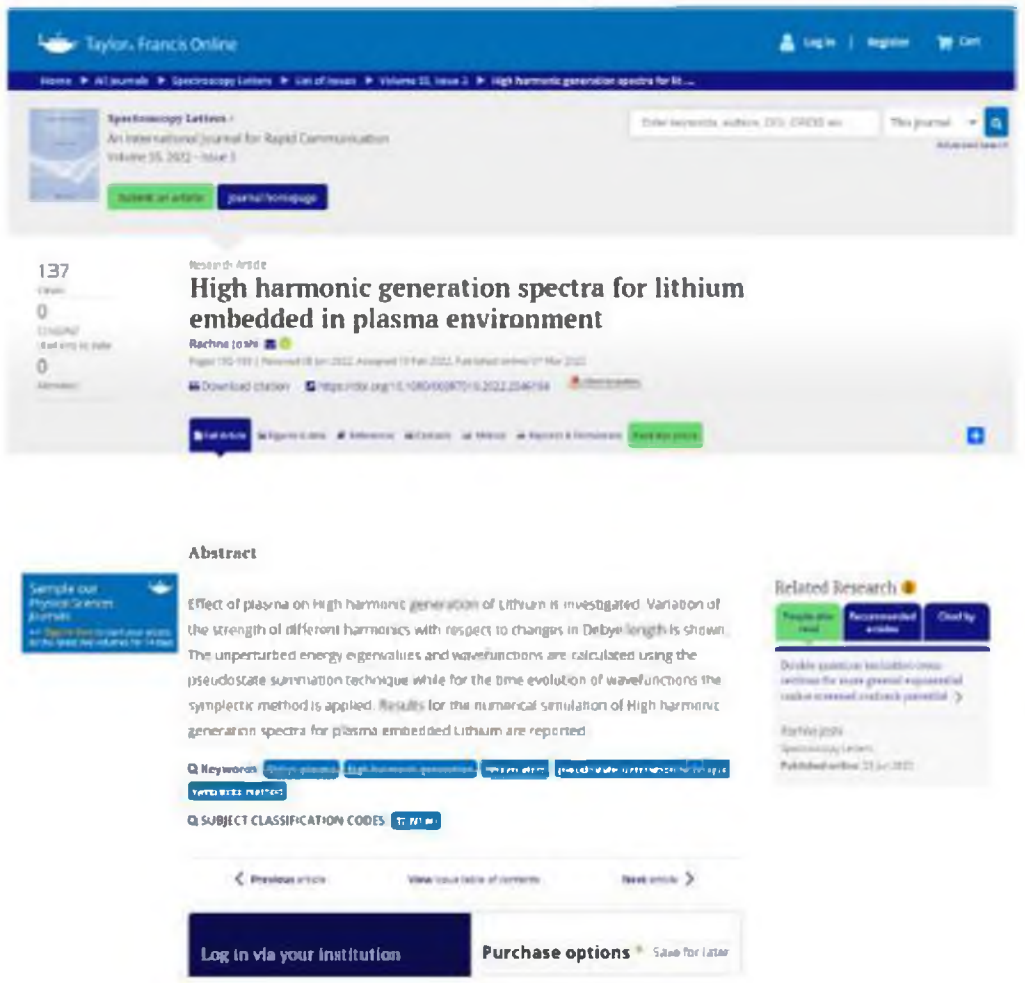
Micrometre double-quantum ionization of Rydberg hydrogen using linearly and circularly polarized light

The European Physical Journal D 76, Article number: 37 (2022) | Cite this article

Abstract

Double-quantum ionization for Rydberg hydrogen is studied. The variation of ionization rates with wavelength is shown for linearly polarized (LP) and circularly polarized (CP) radiations. For performing the infinite summations over the intermediate states, pseudostate summation technique (PST) is used which is fast and efficient. Presently, the numerical values of two-quantum and three-quantum ionization rates from ground state and metastable 2s state only are available in the literature. The present work reports the calculations for the double-quantum ionization rates from higher excited levels of hydrogen. Numerical data is also presented for comparison with future experiments.

Graphical abstract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Research Article
High harmonic generation spectra for lithium embedded in plasma environment
Abstract
Effect of plasma on High harmonic generation of Lithium is investigated. Variation of the strength of different harmonics with respect to changes in Debye length is shown. The unperturbed energy eigenvalues and wavefunctions are calculated using the pseudostate summation technique while for the time evolution of wavefunctions the symplectic method is applied. Results for the numerical simulation of High harmonic generation spectra for plasma embedded Lithium are reported.
Keywords
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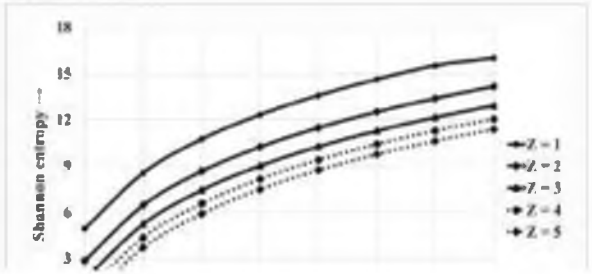
A numerical evaluation of Shannon entropy for modified Hulthen potential

Abstract

We calculate Shannon entropy for Modified Hulthen potential (MHP). Dependence of Shannon entropy on various parameters of the potential is investigated. For solving Schrodinger equation, i.e., for calculation of the wavefunctions, Numerov method has been employed which is fast and efficient. Numerical simulation is performed for the purpose. Novel data for Shannon entropy is presented for a wide range of the parameters of MHP.

Graphical abstract



Applied Surface Science Advances 7 (2022) 100189

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Favourable tuning of optical absorbance, bandgap and surface roughness of ZnO thin films by C ion implantation at the critical angle

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ARTICLE INFO

Keywords:
Low energy ion implantation
Critical angle
Thin film
Band gap
Optical absorbance
Grain size
Surface roughness

ABSTRACT

Low energy ion implantation with exquisite control of angle allows manipulating the applications of thin films. Here we present a favourable and efficient strategy of 50 keV Carbon ion implantations on ZnO thin films at three different tilt angles 0°, 30° and 60°. This plays a significant role in tuning of optical absorbance, bandgap, grain size and surface roughness simultaneously. The TRIM simulations are performed to elucidate the theoretical understanding and to compare the modifications in the physical properties using different characterization tools. These experimental results demonstrate that the ion implantations at 30° result in a significant reduction of 89% in the grain size and 35% reduction in the optical transmittance along with an improvement of 25% in the surface roughness of these thin films. The optical bandgap is also tuned from 3.27 to 3.20 eV. These results establish a new approach in designing the exotic materials with lower grain size, lower bandgap and smoother surface along with higher absorbance of ultraviolet (UV) light that will help increasing the data storage capacity and getting higher energy efficiency with reduced UV light emissions.

1. Introduction

The role of ion implantations has been extensively investigated for the applications in electronics industry and now these are being employed in the nano-structuring and nano-patterning in the semiconductors such as Si, Ge, etc. [1] The energetic incident ions transfer their kinetic energy and momentum to the host atoms which result in the atomic mass redistributions and cascade collisions at the surface of materials. This leads to the surface modifications and the nano-patterning of vivid types [2–7]. In general, structural, optical and magnetic changes are induced by the ion implantations due to the variation in the ion fluence and the energy [8–11]. ZnO thin films are selected due to their excellent metal-oxide material properties and as these have a large probability of intrinsic defects like Oxygen vacancy (V_O) and Zinc vacancy (V_{Zn}) in the surface or volume. The implantation of p-type non-metals like C, N, B, P and Si into ZnO has been found to improve the characteristic properties [12]. There are other advantages with this material such as higher exciton binding energy (approximately 60 meV) along with high tolerance for radiation and wide direct bandgap energy (up to 3.37 eV). This material is selected mostly for scientific research and also for industrial applications [13,14], which have led to the development of promising technologies based on engineering and control of their important and useful physical properties. Various metal and non-metal ion irradiations at high energy (hundreds of MeV) and ion implantations at low energy (tens of keV) at different angles have been performed mainly for generating the ripples on the surfaces. Buddhi et al. [15] have reported that the formation of nano-ripples on gold surfaces is possible by 30 keV Ar cluster ion beam bombardment at different angles. Further, it has also been confirmed using atomic force microscopy (AFM) that the maximum roughness of the gold surface is obtained at an incident angle of 60°. A significant mass redistribution was found by Ar ion beam bombardment at room temperature that led to the formation of nano-ripples on the surface. In the case of off-normal incidence, the target atoms receive the energy from the ions and move in the forward direction. As per the scientific reports, the ion incidence at a grazing angle removes the surface atoms in a very effective manner and smoothens the surface of the thin films without any erosion. Since 1972, ZnO and TiO_2 have been found to have outstanding sustainability and photocatalytic performances because of which these materials are being widely explored [16–18]. ZnO has a bandgap of about 3.24 eV and ultraviolet (UV) light will be required to start the photocatalytic reactions. In general, only 5% UV light can be

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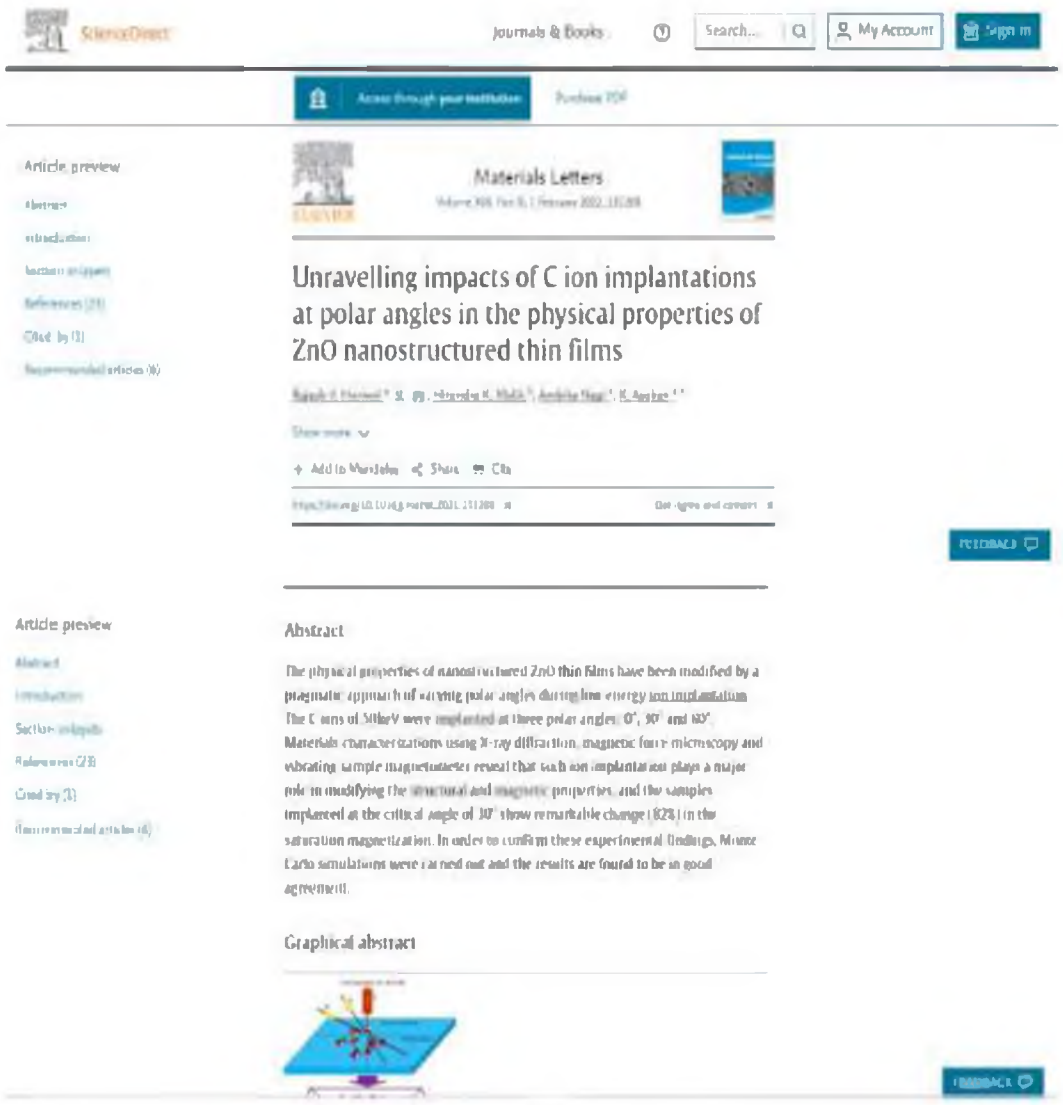
Materials Letters
Unravelling impacts of C ion implantations at polar angles in the physical properties of ZnO nanostructured thin films
Abstract
Graphical abstract

This study presents a model to understand the behavior of the turbulence generated in the magnetic field of mega gauss order during high-intensity laser interaction with magnetized plasma. The modified nonlinear Schrodinger (MNLS) equation is developed by contemplating the effect of the group velocity dispersion, diffraction, and nonlinearity induced by the relativistic variation of electron mass and the nonlinear ponderomotive force. Numerical simulation is carried out to solve the dimensionless MNLS equation. The simulation results show the generation of the solitary wave type coherent structures in the nonlinear spatiotemporal evolution of the laser pulse at the early stage, but subsequent turbulence generation has also been observed. The ensemble-averaged turbulent power spectrum has been studied and the power-law scaling is approximately $\sim k^{-1.45}$ (a solid red line of scaling $k^{-1.45}$ is given for reference). To get insight into the spatiotemporal nonlinear development of the laser pulse while propagating in the plasma medium, a semi-analytical model has also been presented. The present study could be substantial in replicating astrophysical scenarios by laboratory simulations along with understanding the underlying quintessential physics of magnetic turbulence.

Topics
Dielectric properties, Dispersion, Laboratory procedures, Ponderomotive force, Analytical

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Abstract

Pure CdO nanostructured thin films and Ag doped with 1.0, 2.0 and 4.0 wt% doping concentrations were fabricated successfully on glass substrates with a cost-effective spin coating technique. The prepared films exhibit a cubic crystal structure oriented along (111) plane. The surface morphology of the pure CdO films shows a cauliflower shape structure, becomes granular and compact at high Ag doping concentration. Raman spectra of the films reveal LO (longitudinal optical) and TO (transverse optical) vibration modes at 406.80 cm^{-1} and 566.54 cm^{-1}. The absorption of the films significantly varies with Ag doping concentrations and as a result, the electronic structure of the films is tailored. Moreover, the optical band gaps vary in the range of 1.42–1.70 eV. In addition, the optical parameters n, k were studied in correlation with Ag doping concentrations. The obtained room temperature photoluminescence spectra of the prepared films show a broad peak at ~350 nm. The third order nonlinear optical parameters of the films were also examined systematically.

Bulletin of Entomological Research

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Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, *Aedes aegypti* L.

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Research Paper

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Keywords:
Acetamiprid; *Aedes aegypti*; monooxygenase; PBO; resistance; synergism

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Abstract

Aedes-borne diseases are on the rampant rise despite continued application of chemical insecticide-based interventions. The appearance of high degree of insecticide resistance in *Aedes* species and noxious effects on environment and non-targets have raised further concerns. Among new chemical interventions, neonicotinoids are considered a safe and effective approach. The present study investigated the control potency of acetamiprid and development of resistance in *Aedes aegypti* larvae; and the involvement of CYP450 monooxygenases in inducing resistance. The early fourth instars of *Ae. aegypti* parent susceptible strain (PS) were selected with acetamiprid for 15 generations (ACSF strain) increasing the resistance to 19.74-fold in ACSF-10 and 36.71-fold in ACSF-15. The ACSF-10 larvae were assayed with acetamiprid combined with piperonyl butoxide (PBO) in three different ratios (1:1, 1:5 and 1:10) and selected for next five generations with 1:10 combination. Selection with synergized acetamiprid (APSF strains) reversed as well as reduced the rate of resistance development resulting in only 1.35-fold resistance in APSF-15. The APSF strains showed %monooxygenase dependency ranging from 86.71 to 96.72%. The estimation of the monooxygenases levels in parent and selected larvae showed increased monooxygenase level in the ACSF strains by 2.42–2.87-fold. The APSF-15 strains exhibited 57.95% lower enzyme production than ACSF-15 strain. The reduction and reversion of resistance by using PBO and the elevated levels of monooxygenases in ACSF and reduction in APSF strains recommend the involvement of CYP450-mediated mechanism in the development of acetamiprid resistance in *Ae. aegypti*. These studies could help in devising resistance management strategies in order to preserve the efficiency of pre-existing insecticides.

Introduction

Aedes aegypti L. is a widespread mosquito responsible for the transmission of ever-increasing infections causing extensive though variable degree of health hazards in the world, especially in tropical and sub-tropical regions. In several countries, *Aedes*-borne disease, dengue, has become a principal health concern due to worrisome rise to 390 million annual dengue infections with 96 million clinical manifestations (Bhatt *et al.*, 2013). India has recorded a total of 39,419 dengue cases and 56 deaths in year 2020 and 39,419 suspected cases of Chikungunya (NVBDCP, 2021*a*, 2021*b*).

In the absence of vaccines and adequate medication, mosquito-borne diseases are primarily kept under check *via* mosquito management, at larval as well as adult stage. The traditional ways of interventions, such as use of mosquito bed nets, window screens, etc., are still in practice widely. Yet, application of chemical-based measures is on rampant rise to manage complicated-resistant mosquitoes quickly and effectually (Liu *et al.*, 2006; Kumar *et al.*, 2009). Various groups of chemical toxicants have been used against mosquitoes; however, the negative impact of these on the surroundings, and non-target organisms along with the appearance of high insecticide resistance levels among mosquitoes has caused concerns (Bonner *et al.*, 2007; Moore *et al.*, 2009). Several countries have reported insecticide resistance in *Ae. aegypti*, including India (Kushwah *et al.*, 2015), Brazil (Lima *et al.*, 2011), China (Li *et al.*, 2015), Colombia (Fonseca-Gonzalez *et al.*, 2011), Malaysia (Ishak *et al.*, 2015) and Thailand (Yanola *et al.*, 2011); and revealed metabolic detoxification and decreased sensitivity of insecticide-target proteins as the prime cause for the resistance (Bansal *et al.*, 2012; Yang and Liu, 2014).

Among the new approaches and chemical interventions, neonicotinoids, synthetic derivatives of nicotine, are one of the fastest-growing insecticides and considered a safe replacement of the conventional insecticides currently used in the mosquito management. These chemicals induce toxicity in the target insect pest by interacting with nicotinic acetylcholine receptors (nAChRs) of the insect nervous system mediating fast cholinergic transmission (Li *et al.*, 2012). Acetamiprid, a neonicotinoid, reacts with nAChRs located in the post-synaptic neural

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Research Article

Attractive Sugar Bait Formulation for Development of Attractive Toxic Sugar Bait for Control of *Aedes aegypti* (Linnaeus)

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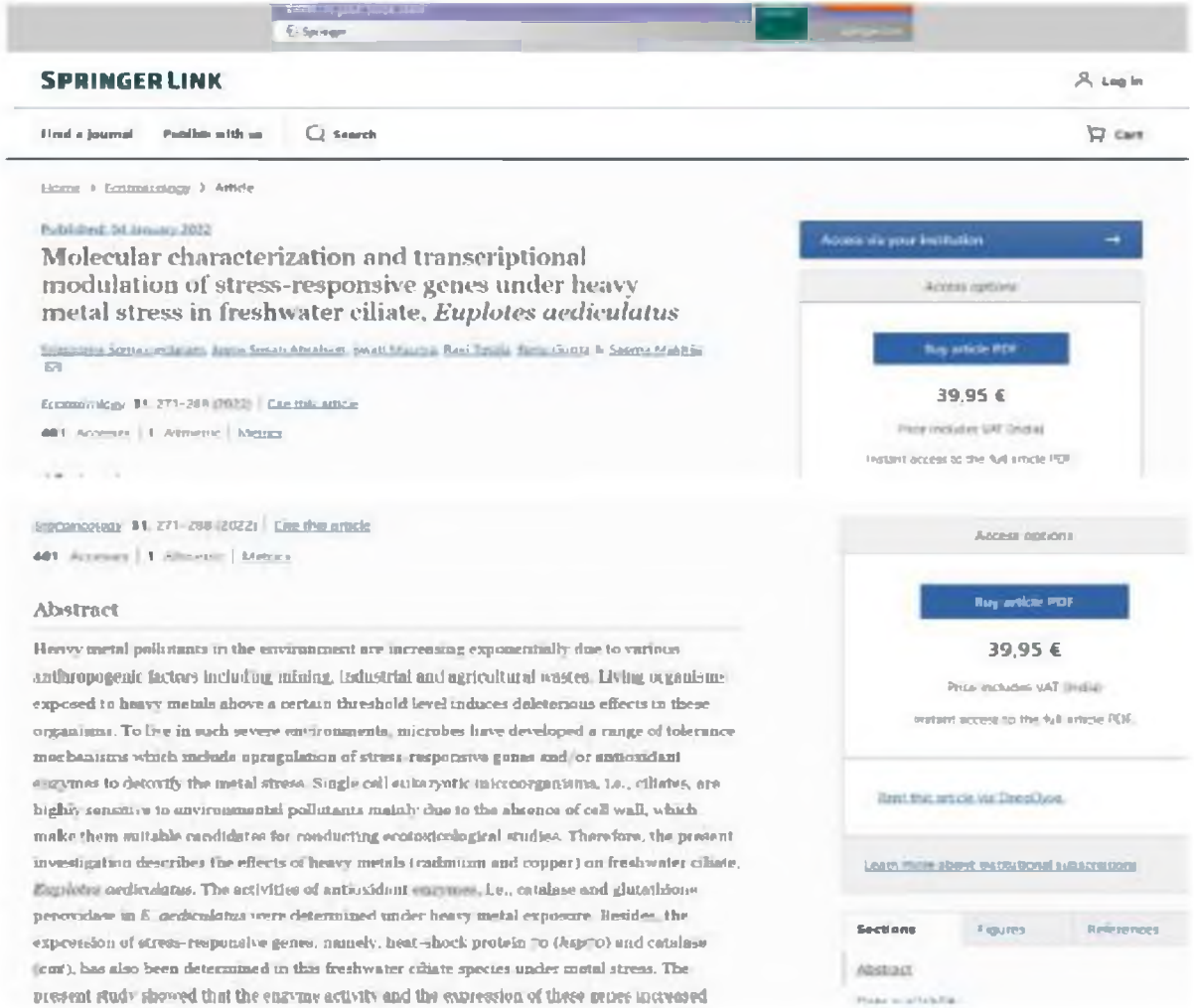
Background. Attractive toxic sugar bait (ATSB), based on "attract and kill" approach, is a novel and promising strategy for mosquito control. Formulation of an attractive sugar bait (ASB) solution by selecting an efficient olfaction stimulant and preparation of an optimized sugar-attractant dosage is a significant component for the success of the approach. *Methods.* Current study evaluated relative potential of nine ASBs, formulated by combination of sugar and fresh fruit juices (guava, mango, muskmelon, orange, papaya, pineapple, plum, sweet lemon, and watermelon) in attracting *Aedes aegypti* adults. Freshly extracted and 48-hour-fermented juices were combined with 10% sucrose solution (w/v) in 1 : 1 ratio. Cage bioassays were conducted against two laboratory strains (susceptible: AND-*Aedes aegypti*; deltamethrin-selected: AND-*Aedes aegypti*-DL10) and two field-collected strains (Shahdara strain of *Aedes aegypti*: SHD-Delhi; Govindpuri strain of *Aedes aegypti*: GVD-Delhi). Each of the nine ASBs was assayed, individually or in groups of three, for its attraction potential based on the relative number of mosquito landings. The data were analysed for statistical significance using PASW (SPSS) software 19.0 program. *Results.* The prescreening bioassay with individual ASB revealed significantly higher efficacy of ASB containing guava/plum/mango juice than that containing six other juices ($p < 0.05$) against both the laboratory and field strains. The bioassay with three ASBs kept in one cage, one of the effective ASBs and two others randomly selected ASBs, also showed good attractancy of the guava/plum/mango juice-ASB ($p < 0.05$). The postscreening assays with these three ASBs revealed maximum attractant potential of guava juice-sucrose combination for all the four strains of *Ae. aegypti*. *Conclusion.* Guava juice-ASB showed the highest attractancy against both laboratory and field-collected strains of *Ae. aegypti* and can be used to formulate ATSB by combining with a toxicant. The field studies with these formulations will ascertain their efficacy and possible use in mosquito management programs.

1. Introduction

Aedes aegypti (Linnaeus) is the major insect disease vector for transmitting viral diseases, dengue, yellow fever, Chikungunya, and Zika [1]. In 2019, the largest number of dengue cases (5.2 million) were ever reported worldwide affecting all WHO regions [2]. Since the use of chemical-based control interventions is associated with environmental concerns, there is a need for natural and environmentally safe interventions [3].

Insecticide-laced attractive toxic sugar bait (ATSB) is considered a new mosquito control method based on the feeding behaviour of mosquitoes [4]. The mosquitoes feed on plant sugars (sucrose and fructose), nectar, honeydew, etc., as a source of energy for their nutrition and survival [5] and use visual and olfaction cues to locate flowers and fruits [6]. Sugar-seeking mosquitoes are attracted by the volatile components of fruits and flowers [7], damaged and rotted fruits [8], and various fruits, edible seeds, flowers, and insect honeydew [9]. Thus, a combination of sugar, an attractant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Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in freshwater ciliate, Euplotes aediculatus
Ecotoxicology 31, 271–288 (2022) | Cite this article
Abstract
Heavy metal pollutants in the environment are increasing exponentially due to various anthropogenic factors including mining, industrial and agricultural wastes. Living organisms exposed to heavy metals above a certain threshold level induces deleterious effects in these organisms. To live in such severe environments, microbes have developed a range of tolerance mechanisms which include upregulation of stress-responsive genes and/or antioxidant enzymes to detoxify the metal stress. Single cell eukaryotic microorganisms, i.e., ciliates, are highly sensitive to environmental pollutants mainly due to the absence of cell wall, which make them suitable candidates for conducting ecotoxicological studies. Therefore, the present investigation describes the effects of heavy metals (cadmium and copper) on freshwater ciliate, Euplotes aediculatus. The activities of antioxidant enzymes, i.e., catalase and glutathione peroxidase in E. aediculatus were determined under heavy metal exposure. Besides, the expression of stress-responsive genes, namely, heat-shock protein 70 (Hsp70) and catalase (cat), has also been determined in this freshwater ciliate species under metal stress. The present study showed that the enzyme activity and the expression of these genes increased
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Abstract

Indian J Microbiol (July–Sept 2022) 62(3):323–337
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REVIEW ARTICLE

Microbial Journey: Mount Everest to Mars

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Abstract A rigorous exploration of microbial diversity has revealed its presence on Earth, deep oceans, and vast space. The presence of microbial life in diverse environmental conditions, ranging from moderate to extreme temperature, pH, salinity, oxygen, radiations, and altitudes, has provided the necessary impetus to search for them by extending the limits of their habitats. Microbiology started as a distinct science in the mid-nineteenth century and has provided inputs for the betterment of mankind during the last 150 years. As beneficial microbes are assets and pathogens are detrimental, studying both have its own merits. Scientists are nowadays working on illustrating the microbial dynamics in Earth's subsurface, deep sea, and polar regions. In addition to studying the role of microbes in the environment, the microbe-host interactions in humans, animals and plants are also unearthing newer insights that can help us to improve the health of the host by modulating the microbiota. Microbes have the potential to remediate persistent organic pollutants. Antimicrobial resistance which is a serious concern can also be tackled only after monitoring the spread of resistant microbes using disciplines of genomics and metagenomics The cognizance of microbiology has reached the top of the world. Space Missions are now looking for signs of life on the planets (specifically Mars), the Moon and beyond them. Among the most potent pieces of evidence to support the existence of life is to look for microbial, plant, and animal fossils. There is also an urgent need to deliberate and communicate these findings to layman and policymakers that

Utkarsh Sood and Gauri Garg Dhingra have contributed equally to this work.

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A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the Landfill and the Soil from the Human Inhabitant Land
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Abstract
Landfilling is considered to be a safe and economical approach for waste disposal but this is true only for engineered landfills. Engineered landfills are seldom found in developing countries like India. The generation of leachate from the landfilled municipal solid waste (MSW) is a major concern nowadays. Leachate is the result of two main phenomena occurring in a landfill: infiltration of water in the deposited waste mass and mass transfer of substances from waste to infiltrating water. This leachate can cause severe environmental degradation and also pollute natural resources like soil and soil microbes. In the present study, the physical and chemical parameters and ciliate diversity of leachate contaminated soil from the Okhla landfill (Okhla L) and non-contaminated soil from human inhabitant site Acharya Narendra Dev College (ANDC) were compared. It was observed that the physical and chemical parameters namely, water holding capacity, pH, electrical conductivity, calcium and magnesium, calcium carbonate, soil organic matter, nitrogen and cation exchange capacity of soil contaminated with leachate from Okhla L was found to be significantly different from the ANDC. The concentration of various heavy metals such as Co, Ni, Cu, Zn, Cd and Pb were
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Nano LIFE | Vol. 12, No. 01, 2130011 (2022) | Review Paper
The Role of Nanotechnology in Antiviral Regime: An Overview
Reena Singh, Seema Gupta, and Pradeep Kumar
https://doi.org/10.1142/S1793984421300119 | Cited by: 1
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Abstract
Nanomedicine or nanotechnology exhibits outstanding features to challenge severe health issues including pathogenic viral infections, the most culpable invaders in the
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of nanomaterials, such as nanogels, nanospheres, nanocapsules, liposomes, nanoparticles and many others, that have been investigated in vivo and in vitro for successful drug delivery, vaccination, diagnostic assay and device development with anticipation to be translated in advanced clinical practices, need a collective relook. This paper intends to contribute insightful critique of current studies on the efficacy of nanoplatforms as drug transporter, diagnostic tool and vaccine candidate against pathogenic viruses causing the highly pathogenic and incurable "coronaviruses".
Keywords: Nanotechnology · viruses · nanotheranostics · nanovaccines · nanoparticles ·
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Identification of perturbed pathways rendering susceptibility to tuberculosis in type 2 diabetes mellitus patients using BioNSi simulation of integrated networks of implicated human genes

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In type 2 diabetes mellitus (T2DM) patients, chronic hyperglycemia and inflammation underlie susceptibility to tuberculosis (TB) and result in poor TB control. Here, an integrative pathway-based approach is used to investigate perturbed pathways in T2DM patients that render susceptibility to TB. We obtained 36 genes implicated in type 2 diabetes-associated tuberculosis (T2DMTB) from the literature. Gene expression analysis on T2DM patient data (GSE26168) showed that *DEFA1* is differentially expressed at P_{adj}<0.05. The human host TB susceptibility genes *TNFRSF10A*, *MSRA*, *GPR148*, *SLC37A3*, *PXK*, *PROK2*, *REV3L*, *PGM1*, *HIST3H2A*, *PLAC4*, *LETM2*, and *EMP2* and hsa-miR-146a microRNA were also differentially expressed at P_{adj}<0.05. We included all these genes and added the remaining 28 genes from the T2DMTB set and the remaining differentially expressed genes at P_{adj}<0.05 in STRING and obtained a well-connected network with high confidence score (≥0.7). Further, we extracted the KEGG pathways at FDR<0.05 and retained only the diabetes and TB pathways. The network was simulated with BioNSi using gene expression data. It is evident from BioNSi analysis that the NF-kappa B and Toll-like receptor pathways are commonly perturbed with high ranking in multiple gene expression datasets of type 2 diabetes versus healthy controls. The other pathways, necroptosis pathway and FoxO signalling pathway, appear perturbed with high ranking in different gene expression datasets. These pathways likely underlie susceptibility to TB in T2DM patients.

Keywords. BioNSi; differential expression; simulation; text mining; tuberculosis; type 2 diabetes

1. Introduction

Patients with type 2 diabetes mellitus (T2DM) are reportedly at risk of acquiring tuberculosis (TB) (Chaudhry *et al.* 2012; Niazi and Kalra 2012; Kapur and Harries 2013). T2DM develops due to insulin resistance. It is on the rise, affecting an increasing number of people every year worldwide (Faurholt-Jepsen *et al.* 2011). The majority of diabetic patients are of T2DM type (Agarwal *et al.* 2016). Also, 10% of deaths due to TB cases are linked to diabetes in low- and middle-income countries (Faurholt-Jepsen *et al.* 2011). Drugs used to treat TB are reported to cause diabetes-associated conditions. Rifampicin reportedly

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http://www.ias.ac.in/jbiosci
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Original research article | Published: 01 November 2022

Pharmacological Manipulation of UPR: Potential Antiviral Strategy Against Chikungunya Virus

Nishtha Agrawal, Sanjesh Sain, Madhu Khanna, Gagan Dhawan & Uma Dhawan

Indian Journal of Microbiology **62**, 634–640 (2022) | Cite this article

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Abstract

Viruses invade the host cells and maneuver the cellular translation machinery to translate the viral proteins in substantial amounts, which may disturb Endoplasmic Reticulum homeostasis leading to induction of Unfolded Protein Response (UPR), a host response pathway involved in viral pathogenesis. Here, we investigated the effect of UPR pathways on the pathogenesis of chikungunya virus infection. We observed that chikungunya virus mediated the modulation of UPR. A positive modulation was observed in the activation of IRE1 and ATF6 branch while the PERK branch of UPR observed suppressed upon virus infection. We further investigated the effect of the inhibition of UPR pathways on chikungunya virus replication using inhibitors for each branch. Cells treated with 3-ethoxy-5,6-dibromosalicylaldehyde (IRE1 inhibitor) and AEBSF (ATF6 inhibitor) significantly inhibits the viral replication process. This study has provided a novel perspective in designing antivirals against chikungunya virus.

Graphical Abstract

Review Paper

Realizing the New Reality: Machine Learning Curbing Antimicrobial Resistance in *Cutibacterium acnes*

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Abstract

Increase in antibiotic resistance is the current cause of global concern facing the human healthcare sector. Dermatologists, particularly face a major challenge, especially when treating acne due to the over-prescription of antibiotics. In an era of tremendous technological advancement, the need for the development of bioinformatics tools and the availability of public databases is the new holy grail to combat antibiotic resistance. With the emergence of machine learning approaches, screening of drug-resistant microbes and identification of known and novel resistant genes have been facilitated for the rapid development of drugs or techniques to combat the problem of resistance.

The whole-genome sequences of Cutibacterium acnes are stored digitally in the PATRIC database for research purposes. With the amalgamation of machine learning algorithms along with the availability of genomic sequences, the prediction of antimicrobial resistance is becoming a reality. The swift and accurate prediction of antibiotic resistance using machine learning tools and algorithms would lower the increasing rate of antibiotic resistance encountered in Cutibacterium acnes and will help dermatologists to combat the problem of Acne vulgaris more efficiently.

Keywords: Antimicrobial resistance, Machine learning, PATRIC database, Whole genome analysis.

Introduction

In recent times, the astronomical growth of antimicrobial-resistant (AMR) infections has become a matter of great concern exposing public health to innumerable threats. According to an estimate, AMR infections are causing around 70, 0000 deaths worldwide on an annual basis. It is also believed that this number will amount to 10 million per year by 2050[30].

Bacteria, which are considered as one of the oldest life forms existing on the earth, have mastered the artwork of evading detrimental conditions that threaten their existence. Selective mutations have empowered them to continue to exist for billions of years making them resistant to the available conventional antibiotics that are being used to treat infections caused by them. Over time, many causative organisms have become smarter and tailored themselves to dodge the medications designed to kill them, rendering the products less effective[26]. Since most bacteria, viruses and other microbes multiply expeditiously, they can quickly evolve and broaden resistance to antimicrobial drugs[10].

The rapid increase of use of antimicrobials readily available in the market is undoubtedly boosting antimicrobial resistance[16]. It is a common practice to administer antibiotics without professional oversight. For instance, it is commonly observed that people suffering from the common cold and flu-like conditions take medication on their own without proper prescription or consultation. An increase in antibiotic resistance is driven by an amalgamation of germs unveiled to antibiotics. Antibiotic resistance is not biased, rather it can affect any individual at any level of life irrespective of their gender and age[2].

Antibiotics are generally administered to cure an infection in the body, however, when the patients stop responding, it does not mean that the body is becoming resistant to antibiotics, rather it is the micro-organism that becomes resistant against the prescribed antibiotics to kill them. These factors lead to the emergence, spread and persistence of multidrug-resistant (MDR) bacteria, which are also referred to as "superbugs"[18,24]. The antibiotics prescribed by a physician against resistant bacteria will only increase the level of resistance and will delay the patient's recovery.

Acne, the most common chronic disease, is the result of abnormal sebaceous production inside pores and skin follicles[11,20]. This leads to abnormal keratinization inside the follicle resulting in a comedo formation. The inflammation process is then prompted and propagated with the aid of *Cutibacterium acnes*, a bacterium that infects the skin. Erythromycin, clindamycin and oral tetracyclines are the most frequently used antibiotics for the treatment of acne [33]. These antibiotics are known to inhibit the growth of bacteria (commonly known as bacteriostatic) rather than killing the bacteria (commonly known as bactericidal). Exposure to such bacteriostatic agents repeatedly results in the emergence of antibiotic-resistant strains of *Cutibacterium acnes* in recent times.

A complete genomic DNA sequence depicts the structural details of the individual traits of an organism or population. Microbial genome sequencing helps in detecting the antibiotic resistance for various pathogens and provides

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Upsurge in biomedical waste due to COVID-19 in India: A statistical correlation, challenges and recommendations

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Proper management of Biomedical Waste (BMW) is an essential component of any sustainable healthcare sector. With the burst of COVID-19 pandemic when every hospital and treatment facility was overburdened patients, efficient handling of the huge amount of generated BMW became a task for the entire world. This review compares the BMW generated before and during the second wave of COVID-19, highlights the challenges in managing the exuberated amount of COVID-19 waste and sites recommendations to promote sustainable design thinking, in order to address this grave concern in the current setting of the Indian system. The study indicated that inappropriate management of waste and the lacunae in the entire chain from segregation to collection until its disposal has posed a serious threat to the wellbeing of healthcare workers, sanitation staff as well as the operators and housekeeping staff at the hospitals, isolation centers and Municipal Corporation. Many states had inadequate number of common BMW treatment facilities (CBMWTFs) leading to inefficient treatment of the excess waste. The behavioural and attitudinal barriers of neglect and ignorance of different stakeholders further aggravated the problem of BMW management to manifolds. To achieve better management we recommend spreading awareness regarding the kind and infectious nature of waste generated by COVID-19 patients and their caregivers, segregation and decontamination of such waste at source and increasing the capacity as well as number of CBMWTFs. Creative ways to recycle the waste must be devised so as to reduce the burden on disposal sites.

KEYWORDS
COVID-19, biomedical waste, India, recommendations, challenges

Research Articles | Published: 06 July 2022

Evaluation of stigma receptivity and its properties in *Helianthus annuus* L. (Asteraceae)

B. Sharma ✉ G. Kalra & H. Verma

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Abstract

Stigma receptivity has a critical role in the development of flowering plants. The time of stigma receptivity is important as it results in pollen recognition, adhesion and formation of pollen tube. The duration of receptivity may vary from few hours to few days. At receptivity, the stigma accumulates different biomolecules required for reproductive success. The purpose of present investigation is to identify the biomolecules and assess their critical role, in receptivity of stigma. Receptivity of *Helianthus annuus* L. (family Asteraceae), is evaluated by activity of enzymatic markers (through enzymatic method for histochemical localization), and the associated signaling molecules (localized by confocal microscopy). Esterases and Peroxidases act as the marker enzymes for receptivity in flowering plants. Interplay of reactive oxygen species (ROS), hydrogen peroxides and flavonoids facilitate stigma to override the stressful environmental conditions and also provide it resistance against pathogens. Present investigations, further reveal that the secondary metabolites present in stigma of sunflower act efficiently against the gram negative (*Escherichia coli*) and gram positive (*Staphylococcus* spp.) bacteria thereby highlighting stigma's ability to defend itself and inflorescence as a whole, from microbial infection during its development. The study, thus highlights the interplay of enzymes, reactive oxygen species and flavonoids in increasing cross-tolerance in

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Research Article

Hydrotrope assisted green synthesis of dicoumarols and *in silico* and *in vitro* antibacterial, antioxidant and xanthine oxidase inhibition studies

Meraj, Pankaj Khanna, Deepshikha Gupta, Shilpa Yadav & Leena Khanna

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Abstract

Aqueous hydrotrope has been employed for the first time to synthesize heteroaryl dicoumarols by condensation of 4-hydroxycoumarin and different heterocyclic aldehydes. This method is highly efficient and green, and the same aqueous hydrotropic solution can be used up to five times without any considerable loss of yield in the product. The synthesized compounds showed good antibacterial potential against Gram-positive (*Staphylococcus aureus*/NTCC 0997 and *B. oceanisediminis*) and Gram-negative (*Escherichia coli*/D0157:H7 and *E. coli rosetta*) bacterial strains using the Resazurin microtiter plate visual method. The MIC value of 312 µg/ml for compounds **3b**, **3k** and **3l** for *S. aureus* while 39 µg/ml for compounds **3a**, **3b** and **3k** for *E. coli* and 625 µg/ml for **3a** and **3b** for *B. oceanisediminis* was observed. The compounds were screened via computational methods like molecular docking studies and molecular dynamic simulations with PDB id's 2W9S and 2EX6. Antioxidant activity was assessed

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An understanding of coronavirus and exploring the molecular dynamics simulations to find promising candidates against the Mpro of nCoV to combat the COVID-19: A systematic review

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A B S T R A C T

The first infection case of new coronavirus was reported at the end of 2019 and after then, the cases are reported in all nations across the world in a very short period. Further, the regular news of mutations in the virus has made life restricted with appropriate behavior. To date, a new strain (Omicron and its new subvariant Omicron XE) has brought fear amongst us due to a higher trajectory of increase in the number of cases. The researchers thus started giving attention to this viral infection and discovering drug-like candidates to cure the infections. Finding a drug for any viral infection is not an easy task and takes plenty of time. Therefore, computational chemistry/bioinformatics is followed to get promising molecules against viral infection. Molecular dynamics (MD) simulations are being explored to get drug candidates in a short period. The molecules are screened via molecular docking, which provides preliminary information which can be further verified by molecular dynamics (MD) simulations. To understand the change in structure, MD simulations generated several trajectories such as root mean square deviation (RMSD), root mean square fluctuation (RMSF), hydrogen bonding, and radius of gyration for the main protease (Mpro) of the new coronavirus (nCoV) in the presence of small molecules. Additionally, change in free energy for the formation of complex of Mpro of nCoV with the small molecule can be determined by applying molecular mechanics with generalized born and surface area solvation (MM-GBSA). Thus, the promising molecules can be further explored for clinical trials to combat coronavirus disease-19 (COVID-19).

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UHPLC ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS (PAH) COMPOUNDS FROM THE SOIL BY QuEChERS AOAC METHOD FROM MANESAR INDUSTRIAL AREA, HARYANA, INDIA

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ABSTRACT

An Ultra-High-Performance Liquid Chromatography (UHPLC) method was developed and validated as per ICH guidelines for the analysis of 16 PAH compounds as per USEPA and various soil samples were analyzed in Manesar located 60 km away from Delhi, capital of India 28.3542° N, 76.9400° E in different seasons. The sampling was done in the industrial areas, agricultural fields, and residential plots all within 10 km radius of the industrial area. In the present study, the QuEChERS method was used for sample preparation, which has shown good recoveries around 80 to 120%. The extraction time was only 10 minutes, followed by the UHPLC technique of run time of just 16 minutes. Average PAH concentration in Manesar soil was found highest in the winter season of industrial areas. ∑16 PAH was 141 ppb in the industrial area in winter, 64 ppb in agricultural fields, and 54.7 ppb in residential plots. The lowest PAH levels were observed in the monsoon season. These values are very less if compared to Brazil, UK, Germany, and Korea.

Keywords: Soil, Manesar, PAH, QuEChERS, UHPLC

INTRODUCTION

Polycyclic Aromatic Hydrocarbons (PAH) are known carcinogenic and mutagenic compounds which are formed by burning organic matter with less oxygen presence and heavy vehicle emissions (**Sorensen, 1994**; **Nam *et al.*, 2003**). Such compounds need to be monitored and checked from time to time in industrial areas. Apart from mutagenicity, they are responsible for many other lungs and respiratory diseases (**Grimmer *et al.*, 1983**; **Yang *et al.*, 1991**; **Rost and Loibner, 2001**). In soil, these compounds are retained in humus and organic matter for a very long time as they are hydrophobic (**Krauss *et al.*, 2000**). Hence soil is the best place to trace out and check for PAH contamination (**Ockenden *et al.*, 2003**). Few studies have already been done in India, like in Delhi (**Kannan and Kapoor, 2004**), Mumbai (**Sahu *et al.*, 2001**), and Ahmedabad (**Ranjani and Shah, 1993**). PAHs are one of the most dangerous pollutants found in soil as per IARC. Higher ring PAHs are more carcinogenic (**Yang *et al.*, 1991**; **Massel and Ollivon, 2004**). The study of PAH becomes very essential in areas where the industries are very close to residential apartments and agricultural fields. Manesar located 60 km away from Delhi, the capital of India 28.3542° N, 76.9400° E is one of the fastest-growing industrial areas and townships. As per Human Rights Documentation Indian Social Institute, (India) Manesar has fertile lands which are used for farming. It's becoming more important to check the PAH levels in Manesar as it's a hub of farming lands, residential, industries, and all within 10 km area. The PAH-contaminated soil can be harmful to farming as PAH can percolate from soil to vegetables (**Wenzrich *et al.*, 2002**). Many studies have shown that if vegetables are grown in PAH-contaminated soil, it may lead to the uptake of PAH in them (**Wenzrich *et al.*, 2002**). High concentrations of PAH compounds were found in vegetables like a tomato at 0.2 µg/kg, spinach at 0.6µg/kg, and cabbage 20.4µg/kg (**M. Klavka, 2003**). So, the study of soil is very crucial to trace out PAH. Currently available and reported PAH analysis methods are long and time taking and use a classical sample preparation and analysis approach. Classical soxhlet extraction technique takes 8 to 12 hours of extraction of PAH from soil and uses a huge amount of extraction solvents which is then analyzed by HPLC technique whose run time was around 30 to 40 minutes for analysis of 16 PAH. This study has identified the use Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) AOAC method which is very quick and rugged. QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) is an acetonitrile-based extraction technique followed by dispersive solid-phase extraction (SPE) (**Anastassiades *et al.*, 2003**). Followed by this extraction technique a new UHPLC method was also developed and validated as per ICH guidelines which separate 16 PAHs in just 16 minutes.

MATERIALS AND METHODS

Regional site description

Manesar located 60 km away from Delhi, the capital of India 28.3542° N, 76.9400° E has become the hub of industrialization and real estate. The faster-growing industrialization needs the huge movement of heavy vehicles run on diesel. NH8 is the highway that connects Manesar to Gurugram and Delhi. Apart from the main highway NH8 various other roads pass through agricultural fields. One such road is Pataudi road which is the easiest and most popular road considered as an alternative to NH8. The frequency of heavy and small vehicles increased drastically throughout the last 5 years due to the sudden outburst of industrialization and real estate construction in Manesar. This road is surrounded by farmlands. PAH study is very essential to check the levels as heavy vehicle exhausts are a potential source of PAHs. Manesar itself has many factories which release smoke from chimneys. Chimneys are potential sources for PAH releases. During winter seasons, many organic materials are burnt like wood and coals as a source of fuel, which is again a potential source of PAH. Hence, PAH study has become essential in Manesar and surrounding areas. The climate of Manesar is dry and hot with a temperature range from 32°C to 48°C. In winter, the temperature ranges from 4°C to 30°C.

Sample collections

For sample collection, the entire Manesar area was categorized into three parts industrial area, an agricultural area, and a residential area. For analysis, 5 cm topsoil was taken through an auger and sieved through 20 mesh sieve, and stored in airtight plastic tubes in a refrigerator at 4°C. Total of 240 samples were collected, 80 samples from each location.

Extraction and analysis of PAH

QuEChERS AOAC technique was used for the extraction of PAH from the soil. In a 50 ml tube, 5gm soil samples were taken, followed by 5ml water and sonicated

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Multicomponent synthetic strategies and perspectives for synthesis of linked or fused coumarin heterocycles

Sharda Pasricha, Kavita Mittal, Pragya Gahlot, Harsimar Kaur, Nishita Avasthi & Shweta

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Abstract

Natural and synthetic hybrid molecules are an attractive scaffold for therapeutic agent development due to their dual/multiple modes of action, minimum or no side effects, favorable pharmacokinetics and other advantages. Coumarin-fused/linked heterocycles are important classes of natural products affording intriguing array of pharmacological activities, which make them ideal for building effective biological scaffolds for medicinal research. Given their promising medicinal applications, an extraordinarily large emphasis is placed on the design of efficient and greener synthetic procedures. Multicomponent reactions (MCRs) are an important tool to expedite the tailoring of a vast number of organic molecules. In recent years, MCRs have simplified access to diverse coumarin heterocycles through molecular hybridization. This review highlights the broad range of science that has arisen from the multicomponent synthesis of coumarin-fused/linked templates bearing heterocycle ring/s either fused or linked to positions 3 or 4 of the pyran ring or the phenyl ring. The review facilitates a better understanding of the role of homogenous or heterogeneous catalyst, inert support and substituents, on the reaction parameters, stereo-/chemo-/regioselectivity of the product. The effect of catalyst functionalization on the number and types of catalytic sites (acidic or basic), stability of the catalyst and synergic catalysis are also discussed. The role of

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Research Article

Entropy for item inclination in sub-community based recommender system

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Abstract
To overcome the new user cold-start problems in collaborative filtering, an innovative framework has been propsed that used entropy for item inclination in sub-community-based recommender system (EISR). It administered demographic filtering on user and item attributes for finding similar users and applied collaborative filtering on rating preferences. The proposed framework leveraged the advantages of traditional group aggregation strategies for delivering good quality recommendations using item preferences of the members of a refined group detected using two-tier approach. At Tier-I, user communities were detected using demographic attributes, which were decomposed into discernible sub-communities by exploiting the item preferences of users. A novel entropy-based hybrid group aggregation method called pragmatic propensity was used to combine the item preferences of members of these sub-communities. Also, experiments conducted using the MovieLens and Book-crossing datasets revealed the better quality of recommendations and the comparison with other algorithms confirmed the effectiveness of the proposed framework.

Keywords
Group recommender systems, Cold start problem, Community detection, Social network, Entropy, Item inclination, collaborative filtering, Demographic filtering, Group aggregation strategies.

1.Introduction
Machine learning (ML) entails self-learning via data usage and experience [1]. It requires no human intervention to uncover patterns in data [2]. Recent work in this area includes classification of liver tumours [3]; extraction of clinical attributes from the breast cancer dataset [4]; prediction of student performance [5]; accurate recognition of complex physical human activity acquired using body-worn sensors [6]. Recommender system (RS) is also an exciting application of ML for suggesting relevant items to a user [7]. ML driven recommendation engines [8] have become ubiquitous in the last few decades. Intelligent web engines have crept in everywhere, recommending everything from movies, songs, food, social media posts to anything conceivable. Unconsciously, everybody is following these recommendations. The apparent reasons are convenience and satisfaction; else, dealing with a profusion of information on the web is quite cumbersome.

Famous online service providers like Facebook, Netflix, Spotify, Amazon, and LinkedIn use recommendation engines to boost sales and enhance customer satisfaction by utilising data filtering techniques of underlying RS [9].

RS uses traditional filtering techniques [10, 11] viz. collaborative filtering (CF), content-based filtering (CbF), demographic filtering (DF), and knowledge-based filtering (KF), along with hybrid filtering techniques that combine the benefits of former techniques [12]. Liao et al. have found that users trust systems that use CF for recommendation over those using CbF or DF and have given pointers for solving cold-start problems [13]. CF is the most sought-after technique that collects users' preferences and predicts their interests. However, unfortunately it suffers from cold-start problems (non-availability of preference information for the new user/item). Recent research points towards the inclusion of user demographic attributes (age, gender and location) to abate these problems [14]. Recently, González et al. have also utilized demographic information to evaluate the bias and unfairness of recommendations given to the minority groups [15].

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Evaluation of Cost benefit Analysis using One-R Supervised Machine Learning Algorithm for Healthcare

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Research Article

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PAPER

Mildly reduced graphene oxide membranes for water purification applications

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Abstract

Presently carbon allotropes namely graphene, graphene oxide (GO) and reduced graphene oxide (RGO) are being extensively utilized for water purification applications. The presence of myriad types of oxygen functional groups in the GO, however, makes this material very hydrophilic, allowing it to absorb water and to swell in moist or watery environments and to significantly damage its intended performance. In contrast, fully reduced graphene oxide membranes are not stable due to fewer oxide groups which are mainly responsible for GO flakes stacking. In the present work, the aforementioned problems are overcome by optimizing the oxygenated functional groups to develop mildly reduced graphene oxide (MRGO) membrane over PVDF (polyvinylidene fluoride) support. GO is reduced by L-Ascorbic Acid (LAA) with different amounts of wt.% and an optimized MRGO membrane is achieved at 10 wt.% of LAA, which is stable and showing comparatively lower swelling than GO membrane. All related structural and optical characterizations like XRD, SEM, EDAX, Raman, FTIR, and Contact angle have been done to evaluate the effect of mild reduction of GO. The studies are indicative of their potential application in water purification.

1. Introduction

Water purification is a method that eliminates harmful chemical compounds [1], organic/inorganic substances [2] including pharmaceutical wastes [3], cations [4] and biological pollutants [5] from water. It also involves distilling (turning a liquid in vapor and further condensing it in liquid form) and deionizing (ion removing by extracting dissolved salts) [6]. The purification of water is mainly aimed at providing clean water. Water purification also meets the needs of safe and drinking water applications in medical, pharmacological, chemical and industrial applications. The purification process reduces contaminant concentrations such as suspended particles, parasites, bacteria, algae, viruses, and fungi [7]. Many technologies are being used for water purification in which membrane-based separation is at high demand because it operates without heating and thus utilizes less electric energy than standard processes of heat separation like distillation, sublimation or crystallization [8]. Since the practical discovery of the first 2D material called graphene, much focus is paid to two dimensional structures in condensed matter physics, material science and chemistry [9, 10]. Due to its unique atomic thickness and micrometer lateral dimensions, 2D materials have increasingly been explored as a fundamental medium to establish separation technologies [11–14]. Graphene oxide (GO), the oxidative form of graphene, is rated at a high level due to its unique permeation path, large surface area, outstanding anti-fouling properties, high chemical tolerance, high hydrophobicity [15, 16]. It is a single layer of carbon monoatomic on the basal planes and sides, formed in a honeycomb with oxide groups (epoxide, carboxyl, and hydroxyl) [17, 18]. Water permeance and dye rejection depend on various parameters. In a recent review article by Moghadam *et al* [19], membranes in form of atomically thin nanosheets or assembled laminated sheets using 2D materials like graphene, the filtration mechanism of gas and liquid species depend on size and density of pores, defects in the

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An Inclusive Science Laboratory for Visually Impaired Students

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Abstract : Education is a powerful tool that has the potential to improve the social and economic condition of a person in a developing country like India. The greatest challenge for the Government is the accomplishment of quality education in inclusive and accessible arrangements for persons with disabilities. The teaching techniques adopted in traditional classrooms aren't usually designed to cater to the need of visually impaired students. Visually impaired students are usually held back from pursuing STEM (Science Technology Engineering and Maths) education and are encouraged to take up humanities and commerce. The lack of resources is mostly responsible for holding back visually impaired students from pursuing Science along with other factors such as the incompetence and attitude of the facilitators. In this work, an inclusive science laboratory for visually impaired students is envisaged using assistive technology that can facilitate them in performing lab experiments. Assistive technology plays a crucial role in the shift of the education system for visually impaired students to an inclusive model. Low cost, easy to use and store, hardware modules with talkable features has been designed to measure temperature, time, to detect contrast and color using Arduino UNO. With the help of these modules, a visually impaired student can be assisted to perform laboratory experiments effortlessly, which otherwise is not made accessible to them.

Keywords: Arduino, assistive technology, Inclusive science laboratory, visually impaired.

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1. Introduction

The economic status of a citizen has its dependence on access to education. Educated youth is incredibly skilled to mold and reinforce growth prospects. Education can enable a person to make an informed decision and further can result in participative citizenship in a democratic environment. The Constitution of India guarantees equality of all its citizens in every respect and this is pertinent to education as well. The right to Education Act was passed by the parliament of India in 2009. It made education, a fundamental right of all children of the age group 6-14 years irrespective of their caste, creed, social status, and even physical disability. To date significant steps have been taken by the Indian Government, both at the central level and at the state level, to promote education amongst children. The Central Government has supported many schemes like District Primary Education Programme (DPEP), Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), Samagra Shiksha to

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FLEXIBLE INVENTORY SYSTEM OF IMPERFECT PRODUCTION UNDER DETERIORATION AND INFLATION

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Abstract: This study emphasizes the development of a flexible inventory system considering rework requirements on imperfect and defective items. This work has considered defective items could be sold at a lower price in the market as compared to the perfect items. The developed model has considered Weibull deterioration and inflation to balance the same amount in the future due to its potential earning capacity. And demand's function depends on price as well as inventory level because a large pile of goods and their price strategy attracts more customers to generate higher demand. The work also supports managerial decision-making by focusing on the volume flexibility system for smooth production runs. The mathematical formulation of the developed inventory system tries to optimize the inventory cost function under a realistic scenario. A solution procedure has been illustrated and assisted with a numerical example. Later, a validation test is also performed to check the robustness of the proposed mathematical model. The findings of the study will support policymakers, strategists, and firms to implement

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Effects of Mass Variation in the Collinear Perturbed Moulton-Copenhagen Configuration

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Abstract. The main idea of this paper is to investigate the motion properties of the smallest body under the gravitational forces of the three collinear spherical primaries. Here we place the three primaries on the same line where the masses of two primary bodies are taken equal and third primary body is having the solar radiation effect. The effects of Coriolis and centrifugal forces on the system is considered. Therefore this system is recognized as collinear perturbed Moulton-Copenhagen configuration. After determining the equations of motion and quasi-Jacobi integral, we numerically illustrate the locations of equilibrium points (in-plane and out-of-plane), regions of motion, Poincare surfaces of section, basins of attraction and periodic orbits. And then the examination of stability for the equilibrium points lie either in-plane or out-of-plane are examined.

1. Introduction

One of the extensions of the restricted three-body problem is the restricted four-body problem in the fields of Mathematics and theoretical Physics. Where two types of configurations are found in the literature. First when the three-primaries are placed at the vertices of a triangle and the second when the three-primaries are placed at the same horizontal line. Till now many researchers have studied about the first type of configuration with various types of perturbations while the second type of configuration is studied by very few researchers. But it is also an interesting configuration for study.

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2010 *Mathematics Subject Classification.* 70F05, 70F15.

Key words and phrases. perturbed Moulton-Copenhagen configuration; variable mass; Jeans law; out-of-plane equilibrium points.

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Neuroquantology | November 2022 | Volume 20 | Issue 17 | Page 115-124 | Doi: 10.14704/Nq.2022.20.17.Nq88017
Deo Datta Aarya, Shashi Prakash, Rahul Boadh, Anand Chauhan, Yogendra Kumar Rajoria, The Implementation of the Pentagonal Fuzzy Number toward the Solution of the Fuzzy Inventory Model with Ramp Demand Function and Three Parameters Weibull Deterioration

The Implementation of the Pentagonal Fuzzy Number toward the Solution of the Fuzzy Inventory Model with Ramp Demand Function and Three Parameters Weibull Deterioration

Deo Datta Aarya[1], Shashi Prakash[2], Rahul Boadh[3], Anand Chauhan[4], Yogendra Kumar Rajoria[5*]

Abstract

The purpose of this study is to provide an ordering strategy for commodities that deteriorate over time using ramp-type demand rates, shortfalls, and deterioration rates. The ramp-type demand function moves up and down through duration up to a particular point before becoming constant. It is predictable. The three-parameter Weibull deterioration rate, which considers both things that have recently deteriorated while being received into an inventory system and items that may deteriorate in the future, shows the changes in deterioration rate over time. Owing to the inclusion of uncertainty, model factors such as deterioration, ordering, carrying, and shortage costs are examined by a fuzzy approach and defuzzy by the GMI method, which optimises the entire average cost for the model. This seems to be applicable for seasonal items as well as newly introduced high-tech items like computers, tablets, and smart phones.

Keywords: Weibull deterioration, Graded mean integration (GMI), Fuzzification
DOI Number: 10.14704/Nq.2022.20.17.Nq88017 Neuroquantology 2022; 20(17):115-124

1. Introduction

Nowadays, numerous organizations allow their businesses to flourish by effectively managing their inventory. As a result, maintaining and controlling stocks is a huge burden for businesses. "Inventory refers to any economically valuable resources that are being prepared for sale at various phases. Inventory management is crucial to the efficient and effective operation of an organization. On the one hand, having too much inventory might add a significant expense to the firm. Holding relatively few stocks, on the other hand, may result in stock-outs and the loss of future clients. The inventory hypothesis provides a solution to these kinds of difficulties by addressing the fundamental considerations of when and how much more to order. One of the fundamental models of inventory theory is the economic order quantity (EOQ) model developed [1]. Nowadays, it is difficult for retailers and distributers to accurately assess demand. Furthermore, most of the time, the inventory decision-maker does not have access to appropriate historical data or statistical assumptions are ridiculous. Using classic inventory models in real life is difficult in each circumstance. To deal with unreliable data in decision-making, it is preferable to use a fuzzy number to define inventory parameters. In developing an inventory model, the impact of deterioration must be considered as a

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Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.


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Optimal strategy for remanufacturing system of sustainable products with trade credit under uncertain scenario
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Abstract
The manufacturing of commodities using cost-effective strategies that decrease adverse environmental effects while conserving raw materials and energy is based on sustainable manufacturing. Through sustainable production, employees, the community, and product safety are all improved. Carbon emissions are also considered as another factor for developing a sustainable strategy during the production process. To develop a policy for the production period for both the manufacturer and the remanufacturer under a fuzzy environment present study, a three-layer fuzzy sustainable manufacturing model has been established, with the producer, remanufacturer, and retailer as contributors, and the effects of economic and environmental factors were addressed. The aim of the article is to minimize overall cost by developing a manufacturing model that takes into account trade-credit policies, product recycling, and carbon emission effects. By

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Indian Journal of Pure & Applied Physics
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Space Dependent Study of Fast Neutron Spectra and Tritium Produ... Rate in a Fusion Reactor Blanket of Li_2O

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Study of spatial spectra and tritium breeding ratio (TBR) in a fusion reactor play a crucial role for the ... operation of a Fusion reactor. In the paper, we have reported the results for the space dependent fast neutron ... energy spectra and TBR in cylindrical assembly of Li_2O. The computed Gamma spectra for point ... Gamma ray emission output. The obtained results for scalar spectra, total flux and TBR in Li_2O are ... corresponding values for natural Li. The space dependent scalar neutron flux in Li_2O has been computed ... configurations (slab, sphere and cylindrical). We find that the shapes of the curves are almost similar, ... flux is found to be highest in the case of cylindrical geometry. This suggests a larger value of total TBR for ... geometry. Further, the study of space variation of total flux for Li_2O and natural Li shows that there is not much ... the shapes and numerical values, however, a little change near the boundary and surface of the assembly ... contained in natural Li. Similarly, the fall in the TBR curves becomes more rapid for the case of Li_2O as compared ... to near the boundary and ... computed results of spatial distributions of TBR for ^6Li and ^7Li (isotopes ... ...ponents with enrichments) obtained results for cylindrical and spherical, and it is found that spherical ... ... both in the case of ^6Li and ^7Li.

Keywords: Lithium oxide blanket, Tritium Production Rate, Tritium Breeding Ratio

I Introduction

Lithium bearing blankets in a futuristic Fusion reactor have been a subject of interest for the past several decades, and continuing efforts are being made to study the neutron energy spectra and achieve a suitable value of Tritium Breeding Ratio (TBR) in ... assemblies of Li compounds.

For a steadfast, safe and self sufficient operation of a DEMO (DEMOnstration) power plant as a futuristic Fusion Reactor, the crucial parameter is Tritium Breeding Ratio and equally important is the study of neutronic spectra related to design and safety analysis of the reactor. Tritium is not available in abundance as a natural resource that may be used as fuel in a fusion reactor, however, it can be created in the blanket enclosing the fusion chamber by a reaction between neutrons and lithium. This makes it important to

Variety of factors influence the value ... choice of breeding material, geometrical ... layout and neutronic calculations', ... suggested evaluation method for TBR ... Transport equation. Studies of Tritium ... with He cooled Lithium Lead Fusion ... also been reported by Indik, Rosaida ... calculations (based on MCNP program ... neutrons ... produced by ... neutrons) ... blanket of Pb-Li does not leak and the ... tritium would be optimal. Salleg'e et al ... an appropriate model for an advanced ... of future TOKAMAK fusion reactor with ... (Li_2SiO_3 material in the form of pebbles ... used as structural material, and beryllium ... multiplier. They studied TBR, and ... should be enriched to 40% for the ...

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RESEARCH ARTICLE | OCTOBER 07 2022

Effect of variation in glancing angle deposition on resistive switching property of WO_3 thin films for RRAM devices

Shiva Lamichhane, Savita Sharma, Monika Tomar, Arijit Chowdhuri

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Journal of Applied Physics 132, 134102 (2022)

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In this paper, nanostructured tungsten oxide (WO_3) thin films are deposited using the RF-magnetron sputtering technique in Glancing Angle (GLAD) arrangement. Variation in the structural, morphological, optical, and resistive switching (RS) characteristics of nanostructured WO_3 film is investigated as a function of GLAD angle (60°–80°). Electrical studies on nanostructured WO_3 films deposited at room temperature are found to exhibit enhanced bipolar resistive switching properties in metal–insulator–metal pattern [Au/WO_3/ITO]. The R_{on}/R_{off} ratio between high and low resistance states was noted to be about 190 besides a minimum set voltage of ~2.22 V in the case of the WO_3 thin film deposited at the 70° glancing angle. A detailed current transport mechanism analysis indicates the existence of ohmic behavior and trap assisted space charge limited conduction as the governing mechanisms at the state of low and high applied bias, respectively. Good data retention characteristics coupled with reproducible and fast RS capabilities obtained with Au/WO_3/ITO device structure promise scope of rapid development in future RS-based novel memory device applications.

Topics

Electrical properties and parameters, Nonvolatile memory, Flash memory, Atomic force microscopy, Magnetron sputtering, Resistive switching, Thin film deposition

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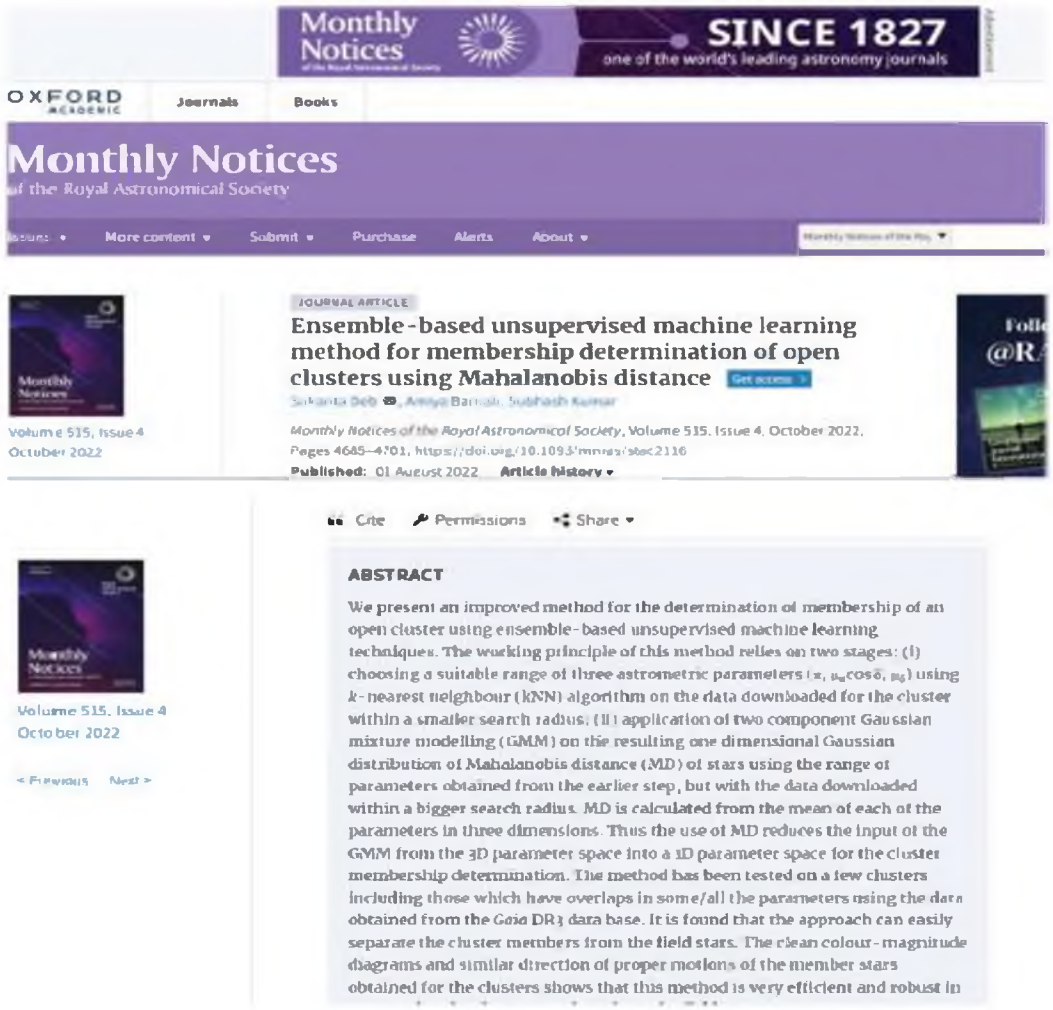
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Ensemble-based unsupervised machine learning method for membership determination of open clusters using Mahalanobis distance
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ABSTRACT
We present an improved method for the determination of membership of an open cluster using ensemble-based unsupervised machine learning techniques. The working principle of this method relies on two stages: (i) choosing a suitable range of three astrometric parameters (ϖ, $\mu_\alpha \cos\delta$, μ_δ) using k-nearest neighbour (kNN) algorithm on the data downloaded for the cluster within a smaller search radius; (ii) application of two component Gaussian mixture modelling (GMM) on the resulting one dimensional Gaussian distribution of Mahalanobis distance (MD) of stars using the range of parameters obtained from the earlier step, but with the data downloaded within a bigger search radius. MD is calculated from the mean of each of the parameters in three dimensions. Thus the use of MD reduces the input of the GMM from the 3D parameter space into a 1D parameter space for the cluster membership determination. The method has been tested on a few clusters including those which have overlaps in some/all the parameters using the data obtained from the Gaia DR3 data base. It is found that the approach can easily separate the cluster members from the field stars. The clean colour-magnitude diagrams and similar direction of proper motions of the member stars obtained for the clusters shows that this method is very efficient and robust in
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Regular Article | Published: 02 September 2022

Two-photon bound-to-bound transitions under strong screening potential

Rachna Joshi

The European Physical Journal Plus 137, Article number: 996 (2022) | Cite this article

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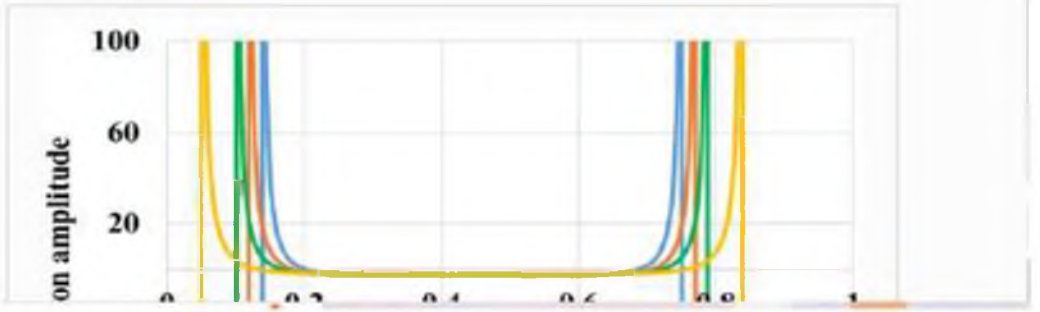
Abstract

Two-photon transition amplitudes for bound-to-bound transitions in hydrogen are calculated for the most general exponential cosine screened Coulomb (MGECSC) potential which is of relevance in many branches of physics. The variation in transition amplitude with different potential parameters is investigated. Enhancement in the transition amplitudes is observed when, on absorption of a single photon, the system is in resonance with an intermediate level. To the best of the knowledge of the author, the MGECSC potential has not been applied previously to the problem of two-photon excitation.

Graphical abstract



Regular Article – Atomic Physics | Published: 26 August 2022

Theoretical analysis of relativistic energy corrections, partition function and thermodynamic properties of spherically confined hydrogen atom

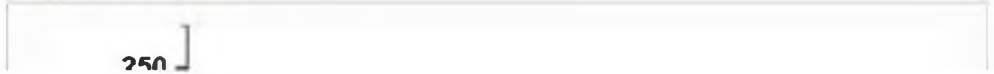
Rachna Joshi, Arun Goyal, Pranav Kumar & Man Mohan

The European Physical Journal D 76, Article number: 149 (2022) | Cite this article

Abstract

The relativistic energy corrections for the spherically confined hydrogen with penetrable wall are calculated for various orbitals as a function of pressure and confinement radius. The relativistic corrections at high pressures of the order of 10^8–10^9 atm are found to be more than thousand times higher than the corresponding values for the free atom. For calculating the energy eigenvalues, the efficient Numerov method is adopted. The partition function and other thermodynamic properties are also calculated for temperature range 10^4 K to 10^{10} K at low (0–10 atm) and high pressures (10^4–10^8 atm). We investigate the behaviour of partition function and thermodynamic parameters graphically with pressure and temperature. We discuss the effect of high temperature and reduction of confinement radius on these parameters. The present study will be useful in Industrial applications like development of hydrogen fuel and in various physics branches such as in fusion and astrophysical plasma, condensed matter, statistical mechanics and also in other research areas where we encounter atoms which are subjected to high pressures.

Graphical abstract



RESEARCH ARTICLE

A novel RP-HPLC method for quantification of cholinesterase activity in human blood: An application for assessing organophosphate and carbamate insecticide exposure

Sukesh Narayan Sinha[1☯*], **Ramakrishna Ungarala**[1☯], **Dileshwar Kumar**[1☯], **Rajendra Sangaraju**[1☯], **Sarita Kumar**[2☯]

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Data Availability Statement: All relevant data are within the paper.

Abstract

Several methods have been reported to estimate Acetylcholinesterase (AChE) enzyme activity in blood samples. The Ellman assay is the most important among all but with several shortcomings, and there is a need to develop a method which is accurate, sensitive and quick for analyzing AChE. Therefore, we have developed an assay utilizing RP-HPLC with UV detection for the determination of AChE activity. This method measured the conversion of 1-naphthol acetate to 1-naphthol to estimate AChE activity in blood samples. Performance was judged on the basis of reproducibility, sensitivity, accuracy, and the ability to screen enzyme activity within 20minutes. A series of experiments were performed, varying the concentration of blood and substrate, with optimal sensitivity using 50 μM substrate and 10μL blood. The validation parameters such as linearity (R^2 of ≥ 0.9842 for 1-naphthol and ≥ 0.9897 for 1-naphthol acetate), precision (94.21–96.41%), accuracy (85.2%–99.6% and 82.6%–99.3% for 1-naphthol and 1-naphthol acetate respectively), and robustness were validated according to International Conference on Harmonization (ICH) guidelines. Blood samples were collected from healthy people, farmers exposed to spraying of pesticides, and suicidal patients who ingested pesticides and were hospitalized and were analyzed by the developed method. The AChE level was approximately 21 units/mL compared to 24units/mL in controls, whereas suicidal patients showed the least AChE levels of 1 unit/mL. The employment of this method is recommended for estimating AChE level on various matrices.

Introduction

Pesticides are routinely used in agriculture, especially organophosphorus (OP) and carbamate pesticides. Pesticide residues in drinking water and food have sparked health concerns. There

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Morphological and physiological changes induced by *Achyranthes aspera*-mediated silver nanocomposites in *Aedes aegypti* larvae

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Aedes aegypti is responsible for the global spread of several ailments such as chikungunya, dengue, yellow fever, and Zika. The use of synthetic chemicals is the primary intervention in mosquito management. However, their excessive utilization resulting in the spread of toxic ingredients in the environment and posing threats to beneficial organisms has prompted the recommendation for the use of biologically synthesized nanocomposites as a promising approach for vector control. Silver nanocomposites were synthesized using leaf (AL-AgNCs) and stem (AS-AgNCs) extracts of *Achyranthes aspera*. The early fourth instars of *A. aegypti* were exposed to lethal doses of these nanocomposites to evaluate their effects on larval development, behavior, morphology, and mid-gut histoarchitecture. The cellular damage and deposition of nanocomposite residues in the mid-gut were studied using light and transmission electron microscopy. The *A. aspera* silver nanocomposite (AA-AgNC)-exposed larvae exhibited dose-dependent extended duration of development and diminished adult emergence, but did not exhibit modified behavior. Intense damage to the cuticle membrane and slight contraction in the internal membrane of anal papillae were noticed. Morphologically, the mid-gut appeared disorganized, darkly pigmented, and shrunk. Histological investigations of the mid-gut revealed significantly disordered internal architecture with lysed cells, damaged peritrophic membrane and microvilli, disintegrated epithelial layer, and a ruptured and displaced basement membrane. Visualization of the larval mid-gut through TEM showed severe cellular damage and aggregation of black spots, indicating the deposition of silver particles released by AA-AgNCs. The investigations revealed the bio-efficacy of *A. aspera*-mediated AgNCs against *A. aegypti* inducing stomach and contact toxicity in the larvae. The utilization of AA-AgNCs is recommended for *A. aegypti* management as a safe and effective intervention.

KEYWORDS
Achyranthes aspera, *Aedes aegypti*, development, histological architecture, morphology, silver nanocomposites, stomach poison, TEM

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Research Article
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Docking-Based Virtual Screening Ascertaining β-Sitosterol-Induced Alterations in the *Helicoverpa armigera* Hübner Gut Enzymes

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ABSTRACT

Present investigation attempts to study binding of β-sitosterol with *Helicoverpa armigera* midgut enzymes; alanine aminotransaminase (ALT), aspartate aminotransaminase (AST) and alkaline phosphatase (ALP); through docking-based virtual screening. Extraction of the protein sequence of the enzymes revealed a respective linear chain of 535, 522 and 430 amino acids for ALP, ALT and AST. The binding energy for ALT-ligand complex was lowest as compared to the AST and ALP-docked complexes. The ALT-docked complex had ligand efficiency of (-) 0.32 with an inhibition constant of 104.01, more hydrogen bonds and hydrophobic interactions leading to a more stable complex. However, unfavored bumps in AST and ALP complexes may have led to comparatively unstable complexes. The dietary β-sitosterol exhibits differential binding with midgut enzymes of *H. armigera* larvae. The strong binding of β-sitosterol with ALT indicates the highest inhibition of ALT activity due to the activity-stability trade-off. The enzymes, AST and ALP exhibited relatively higher activity as a resultant of lesser stabilization of the β-sitosterol-enzyme complex. *In silico* studies have indicated that β-sitosterol can be used an effective control agent against *H. armigera*.

Keywords: *Helicoverpa armigera*, β-sitosterol, alanine aminotransaminase (ALT), aspartate aminotransaminase (AST), alkaline phosphatase (ALP), docking-based virtual screening.

Mishra, M., Sharma, A., Dagar, V.S., & Kumar, S. (2022). Docking-based virtual screening ascertaining β-sitosterol-induced alterations in the *Helicoverpa armigera* Hübner gut enzymes. *Journal of the Entomological Research Society*, 24(2), 209-218.

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An overview on non-*Apis* bees *vis-ă-vis* the exploration of integrated taxonomic approach (Hymenoptera: Apoidea)

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Abstract
Easy and proficient identification of species or organisms is important for various users, such as conservationists, physiologists and ecologists, etc. Taxonomy is a significant branch of biological sciences to classify the different species and understand their relationships. Currently, taxonomy's existence is under crisis and its future protection is required in coming times. Majority of taxonomists are using phylogenetic approach for classifying different species. However, scientists believe that taxonomy should be integrative based on a comprehensive framework for delimiting and describing taxa through integrated information using various data and methodologies. This novel approach does not aim to replace the traditional taxonomy but stresses upon the delineation of species over naming new species. Integrative taxonomy defines the units of species diversity employing multiple approaches; like population genetics, phylogeography, ecology, comparative morphology, development and behaviour, etc. Disagreements among disciplines over the number and demarcation of species can be resolved by using molecular data explaining the evolutionary relationships among species. We present a comprehensive review to explore and identify various non-*Apis* bees and their relationships using integrated taxonomical approaches. We believe that the phylogenies and supportive data can collectively provide a comparative framework for understanding the evolutionary relationships among bee families.

Key words: Integrative taxonomy, non-*Apis* bees, phylogenetic relationships, review, species delineation.

Introduction

Taxonomy is a highly significant branch of biological sciences which mainly aims to classify the different species and understand their relationships between them. Currently, scientists believe that taxonomy' existence is under crisis and its future protection is required in coming times (Wheeler et al. 2004). It is estimated that around 10 million more species exist in nature which still remain to be discovered and in order to do this, we must clarify the nature of primarily two taxonomic tasks, namely delineating and classifying species (Wheeler et al. 2004). These two scientific tasks are currently performed by taxonomists in different ways.

Earlier species diversity and identification studies completely relied on the traditional taxonomy based on morphological characters. Currently, phylogenetic study is a major approach of taxonomists for classification of different species an to reconstruct innate relationships among living organisms; though, in early 1970s, phylogenetic method was a challenge to the taxonomists (Felsenstein 1979). Traditional taxonomists, however were not only in consonant with population biologists and phylogeographers but they also disagreed methodology developed by them for delimiting species (Sites & Marshall 2003). The communication gap between different disciplines involved in delimiting species resulted in 'taxonomy crises'. In order to solve this, scientists believed on integrative taxonomy proposing that this amalgamation will decide the future of taxonomy in coming times.

The term 'Integrative taxonomy' came into existence in 2005 implying a comprehensive framework for delimiting and describing taxa through integrated information using various data and methodologies (Will et al. 2005). The diversity and phylogenetic relationships studies on the families of various major insect groups, such as Coleoptera (Bhardwaj & Jyoti 2018), Hymenoptera (Sharkey et al. 2011), Diptera (Cameron et al. 2007) and Hemiptera (Medeiros et al. 2013) have been carried out by many researchers worldwide. However, the suspect of many systematists that majority of species would remain undescribed using

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Metabolic detoxification and *ace-1* target site mutations associated with acetamiprid resistance in *Aedes aegypti* L

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Despite the continuous use of chemical interventions, *Aedes*-borne diseases remain on the rise. Neonicotinoids are new, safer, and relatively effective pharmacological interventions against mosquitoes. Neonicotinoids interact with the postsynaptic nicotinic acetylcholine receptors (nAChRs) of the insect central nervous system, but the absence of nAChR polymorphism in resistant phenotypes makes their involvement in neonicotinoid resistance uncertain. Thus, an investigation was carried out to understand the role of metabolic detoxification and target site insensitivity in imparting acetamiprid resistance in *Aedes aegypti* larvae. Studies were conducted on the parent susceptible strain (PS), acetamiprid-larval selected strain for five generations (ACSF-5; 8.83-fold resistance) and 10 generations (ACSF-10; 19.74-fold resistance) of *Ae. aegypti*. The larval selection raised α-esterase and β-esterase activities by 1.32-fold and 1.34-fold, respectively, in ACSF-10 as compared to PS, while the corresponding glutathione-S-transferase and acetylcholinesterase activity increased by 2.2.5 and 2%. The *ace-1* gene in PS and ACSF-10 showed four mismatches in the 1312–1511 bp region due to mutations in the Y455C codon (tyrosine to cysteine) at the 1367th position (TAC→TGC); I457V codon (isoleucine to valine) at 1372 bp and 1374 bp (ATA→GTG); and R494M codon (arginine to methionine) at 1484 bp (AGG→ATG). The R494M mutation was the novel and dominant type, observed in 70% ACSF-10 population, and has not been reported so far. The studies evidenced the combination of metabolic detoxification and target site mutation in imparting acetamiprid resistance in *Ae. aegypti*.

KEYWORDS
Aedes aegypti, acetamiprid, resistance, metabolic detoxification, mutation, target site

Introduction

Aedes aegypti L. is a widespread disease vector posing a wide range of health risks, particularly in tropical and subtropical areas owing to favorable climatic conditions. Ever since the emergence of various *Aedes*-borne diseases, dengue has become a major public health concern, with reports of 390 million annual dengue infections and 96 million

EVIDENCE OF BREEDING OF *JAMIDES BOCHUS* (STOLL, [1782]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN NEW DELHI, INDIA

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Reviewer: Peter Smetacek

The butterfly Dark Cerulean (*Jamides bochus*) was first recorded in Delhi by Larsen in 1985, who considered it a case of migration (Larsen, 2002). It was also reported from Delhi in the late 1990s (Chaudhary *et al*., 2019, Dr. Surya Prakash, *pers. comm.*). The sighting of Dark Cerulean however has become quite frequent in Delhi during the last five years, with several sightings between July to March every year (Chaudhary *et al*., 2020, Rajesh Chaudhary unpublished records). It was also found laying eggs on its host plant *Millettia pinnata* (L.) Panigrahi (Fabaceae) in Delhi on one occasion in the year 2020, indicating that it might have extended its breeding range towards drier parts of North-west India (Chaudhary *et al*., 2020).

In the present communication, we report additional supporting evidence which strengthens our assertion that the recent sighting records of Dark Cerulean in Delhi are members of a breeding population rather than of migrants.

An individual of Dark Cerulean butterfly was spotted hopping on the ground in a residential area of South Delhi (28° 32 '22" N, 77° 15' 46" E) on 31.viii.2022, close to its host plant *Millettia pinnata* (Figure 1). On close examination, it was found that both the wings on one side of the butterfly were malformed (Figure 1). The butterfly was also found to be freshly eclosed. It could barely fly 1-2 meters at a time.

The above observations indicate that this individual of Dark Cerulean eclosed with malformed wings in the area where it was spotted. Therefore, it is additional evidence which affirms the breeding status of Dark Cerulean in Delhi.

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SIGHTING OF RUDDY MEADOW SKIMMER *NEUROTHEMIS INTERMEDIA* (RAMBUR, 1842) (INSECTA: ODONATA: LIBELLULIDAE) IN DELHI, INDIA

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The dragonfly, Ruddy Meadow Skimmer (Paddyfield Parasol) *Neurothemis intermedia* (Rambur, 1842) is widely distributed in India, Sri Lanka and many South-East Asian countries (Fraser, 1936; Subramanian, 2009; Singh, 2022). In India, it is found throughout peninsular India, Bengal, Assam, and Sikkim (Fraser, 1936; Subramanian, 2009). In northwest India, it has been reported from the states of Uttarakhand, Uttar Pradesh, Punjab, Himachal Pradesh, Haryana and Rajasthan (Singh, 2022). Despite its widespread occurrence in northwest India, it has not been reported from Delhi (Kumar, 1997; Singh, 2022). This dragonfly is usually found in grasslands, marshy vegetations near ponds and lakes, and paddy fields (Suri Babu, 2000; Subramanian, 2009; Singh, 2022). It is seen on the throughout the year except during winter months as long spells of cold temperature slow down the development of larval stage (Suri Babu, 2000).

Males of the Ruddy Meadow Skimmer have a bright red abdomen with brownish ventro-lateral stripes; rusty-brown thorax; transparent wings with an amber-yellow patch at the base of both the pairs of wings. Females are similar to males, but have more defined ventro-lateral abdominal markings; pale-yellow wings, and lack the amber-yellow patch at the base (Fraser, 1936; Subramanian, 2009; Singh, 2022). An andromorphic form of female Ruddy Meadow Skimmer has been reported in one instance from central India (Prasad, 2000; Joshi *et al.*, 2020).

An individual of *Neurothemis intermedia* was observed in the residential area in northwest Delhi (28° 42' 30" N, 77° 07' 49" E) on 2nd August 2020, at 10:30 am. The dragonfly was roosting on a cable wire, and was photographed using digital SLR camera (Figure 1). The features of dragonfly notable from the photographs include-pale labrum, clypeus and frons; eyes - reddish-brown above and pale-grey below; thorax, rusty-brown and bright red abdomen with ventro-lateral blackish-brown stripes interrupted at apical end of the segments; both pairs of wings with amber-yellow base and dark reddish-brown pterostigma. These features are indicative of the individual being a male. However, it possessed female-like anal appendages (Figure 1C). Thus, the observed individual of Ruddy Meadow Skimmer was an andromorphic form of female.

The observed Ruddy Meadow Skimmer could be a vagrant to Delhi. It is also possible that the species is a resident of Delhi, and the observed individual has migrated into the residential area from its

OVIPOSITING RECORD OF TAILLESS LINEBLUE *PROSOTAS DUBIOSA* (SEMPER, [1879]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) FROM THE VICINITY OF DELHI

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The butterfly, Tailless Lineblue is widely distributed in India (Varshney & Smetacek, 2015; Kehimkar 2016). It was, however, recorded only recently from Delhi and its immediate vicinity (Chaudhary *et al.*, 2021). Since then, it has been reported on several occasions from the aforementioned area during monsoon and post-monsoon months i.e. August to December (Rajesh Chaudhary, *personal observations*). It is not apparent if the recent sightings of Tailless Lineblue in the area are a case of chance migration or if the observed individuals belong to a breeding population (Chaudhary *et al.*, 2021). In the present communication, the ovipositing of Tailless Lineblue at the Aravalli Biodiversity Park, Gurugram is reported. The Park touches the southwestern boundary of Delhi and is an ecological restoration site planted with flora native to the Aravalli hills.

Two individuals of Tailless Lineblue were seen laying eggs on nascent flower buds of the tree *Acacia leucophloea* (Roxb.) Willd. in Aravalli Biodiversity Park, Gurugram (28°29'02"N, 77°06'50"E) on 15.x.2022 (Figure 1). These individuals were observed for about 20 min, and photographed using a digital SLR camera fitted with a telephoto zoom lens. Throughout the duration of observation, both individuals laid eggs several times on the *Acacia leucophloea* tree.

The above observations indicate that individuals of Tailless Lineblues which are being sighted so often in Delhi and its vicinity in recent times belong to a population breeding in this area. The present observation adds Tailless Lineblue to the list of butterfly species that are known to breed in Delhi and its immediate vicinity.

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Arbuscular mycorrhizal fungi and host-plant relationship with respect to heavy metal remediation of soil

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ABSTRACT

A multitude of contaminants have entered the environment and are harmful to living beings. Agricultural plantations growing in unfavourable environments undergo various abiotic stresses due to heavy metals. These factors reduce plant growth and pose a threat to the plant population. Various traditional techniques are used to remove contaminants from the contaminated soil, like incineration, soil washing, chemical precipitation, soil excavation, detonation, and many more. Recently, phytoremediation is proving to be very effective as a green method of soil remediation and involves using plants to extract, sequester and detoxify pollutants. Many recent studies have shown that using hyperaccumulators associated with efficient endophytic or rhizosphere microbial communities is efficient in enhancing phytoremediation. In this context, arbuscular mycorrhizal (AM) fungi may be a highly suitable contender because they are an indispensable member of rhizosphere microflora. Their application to hyper-accumulators is important. The combined effect of both can improve the efficiency of the remediation process by shortening the mitigation cycle and can help maintain the stability and persistence of remediation. This review will explain two main aspects of AM fungi - Plant relationship with respect to HM remediation of soil.

Key words: Heavy metals, Soil remediation, Phytoextraction, Phytostabilization

INTRODUCTION

In the environment, many contaminants pose a threat to living organisms. Among these heavy metals, pesticides, radionuclides, and persistent organic pollutants (POPs) are key contaminants of concern. Pesticides, notably chlorinated organic chemicals (aldrin, DDT, dieldrin, lindane, endosulfan, and others), were used extensively in farming techniques, resulting in their persistence in air, water, and soil, as well as biomagnification or bioaccumulation in living systems/cells. This is owing to their hydrophobicity, nonpolarity, lipid solubility, and volatility (Hagen and Walls, 2005; Jayaraj *et al.*, 2016). Similarly, the usage of heavy metals such as arsenic (As), copper (Cu), lead (Pb), cadmium (Cd), nickel (Ni) and mercury (Hg) in different medicinal, industrial manufacturing, and agricultural sectors resulted in significant environmental discharge. Furthermore, radioactive wastes produced by nuclear power plants, industries, nuclear research facilities, or medical facilities emit hazardous ionizing radiation into the environment (Hatra, 2018). All these pollutants induce a variety of diseases or abnormalities in lower and higher animals, including humans, ranging from metabolic issues to reproductive failure, neurotoxicity, developmental disorders, and cancer (Brenner *et al.*, 2003; Stewart *et al.*, 2008; Briz *et al.*, 2011; Alavanja and Bonner, 2012; Huang *et al.*, 2019; Vardhan *et al.*, 2019). Among the several pesticide chemical families, organophosphates, organochlorines, pyrethroids, and carbamates are the most well-known insecticides. Chlorinated pesticides such as benzene hexachloride (BHC), dichloro-diphenyl-trichloroethane (DDT), aldrin, hexachlorocyclohexane (HCHs), dieldrin, heptachlor, and others have long-lasting effects. During the 1940s and 1970s, pyrethroids were the most popular insecticides. However, their toxicity, persistence, and bioaccumulation in nontarget organisms were phased out and replaced by relatively less toxic compounds, carbamates, organophosphates, and pyrethroids compounds (Shen and Wania, 2005; Ritter, 2009; Hussain *et al.*, 2009). Heavy metals such as Cd, Hg, Co, As, Pb, chromium (Cr), zinc (Zn), and Ni are required in different biological processes such as cell metabolism (Co), electron and oxygen transport (Cu and Fe), hormone and antioxidant production (Se), enzymatic activity (Mg). They have deleterious effects in all organisms (humans, animals, and plants) at low concentrations (Nagajyoti *et al.*, 2010; Chibuike and Obiora, 2014; Ayangbenro and Babalola, 2017; Li *et al.*, 2019). Heavy metals are extensively used in medicine (diagnostic imaging, drugs), industry (electric appliances, automobiles, machinery, tools, utensils), agriculture (fertilizers/biocides), and domestic infrastructure (buildings, bridges) due to their beneficial properties such as electrical conductivity, strength, and durability (Tchounwou *et al.*, 2012). This results in their widespread presence in the environment. However, a strong affinity for sulfur (thiol group-SH), higher electro-negativity (hexavalent chromium), and lipid solubility (Hg) cause myeloma, CNS disorders, metabolic, and degenerative conditions/disorders in living organisms via various routes like occupational exposure in humans, bioaccumulate transfer (through food chain), and dermal absorption (Tchounwou *et al.*, 2012; Pratush *et al.*, 2018; Vardhan *et al.*, 2019; Phian *et al.*, 2022).

Agricultural plantations growing in unfavorable environments undergo various abiotic stresses due to heavy metals. These factors reduce plant growth as well as pose a threat to the plant population. Metal stress in soil reduces the

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Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from Wastewater

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Abstract-**Reactive dyes which are mainly used for dyeing cotton and other cellulose-based fibers are released in huge quantities into water bodies. They are associated with several harmful effects including allergic dermatoses, respiratory diseases, colonic and rectal cancers, etc. In this paper, we report a novel and facile synthesis of bio-nanocomposite of magnetic guar gum (BMGG) wherein the polymeric network of guar gum is decorated with spinels of magnetic nanoparticles via a simple hydrothermal method which shows promising removal efficiency for reactive dyes. Physicochemical techniques such as FESEM, TEM, EDAX, FTIR, Raman, TGA, VSM, pHzpc and XRD have been used for characterizing the as-synthesized nanocomposite. Batch adsorption studies carried out on BMGG showed rapid and excellent adsorption potential of the semi-synthetic material exhibiting a removal efficiency of up to 98.44 % within an hour with a maximum adsorption capacity of 526.32 mg g^{-1} for anionic Reactive green 19 dye from aqueous medium. The adsorption kinetics data fitted best into the pseudo-second-order model. Out of various isotherm models being studied such as Langmuir model, Freundlich and Temkin model, the adsorption equilibrium was found to be best described by the Langmuir isotherm model. The spontaneous as well as the exothermic nature of the adsorption phenomenon, is clearly evident from the thermodynamic studies. BMGG composites also showed significant regeneration capacity showing retention in adsorption efficiency even up to several cycles of adsorption-desorption process. Hence, the reported semisynthetic nanomaterial holds a good scope of playing a significant role in solving the perpetual challenge of water pollution.**

Keywords: **adsorption, kinetics, isotherms, reactive green 19, adsorption capacity**

I. INTRODUCTION

Over the last 10 years, researchers from various domains have been putting in relentless efforts in the field of exploration and design of sustainable materials that can be utilized as adsorbents for the removal of toxic contaminants from wastewater, most importantly synthetic dyes. Among several categories of dyes being synthesized, Reactive dyes are the ones that are used on an extensive scale. A Reactive dye primarily has chromophores containing an azo or anthraquinone moiety along with a number of other reactive groups such as an activated double bond (e.g., vinyl sulphone) or a heterocycle (e.g., trichloropyrimidine, chlorotriazine or difluorochloropyrimidine) (Mahmoud et al., 2007). Reactive dyes, owing to a multitude of advantages such as chemical stability, easy accessibility, fast and facile binding with the fabric, have been used on large scale for coloring cellulosic/cotton fabric. Due to their chemical stability and high solubility in aqueous medium, these dyes are non-biodegradable due to which they pass untreated from the effluents through most of the conventional treatment methods (Özacar et al., 2013). Various basic parameters such as temperature, salt concentration, and alkaline condition along with the reactivity and diffusion coefficient of the dye play a crucial role in determining the dye fixation efficiency of reactive dyes on cellulosic fabrics (Hossain et al., 2020, Lee et al., 2019). Nevertheless, the efficiency of dye fixation on cellulosic fibers is considerably low varying from only 50-90%, which results in low absorption of these dyes on the fabrics. This, in turn, leaves a high content

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Bibliometric Analysis of Peer-Reviewed Literature on Stress Factors Affecting Agricultural Productivity

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Abstract

Sustaining agricultural productivity is essential to ensuring food security. Climate change, increasing population and dwindling resources are factors of concern threatening crop productivity. Research across the globe have focused on seeking innovative measures to protect and enhance crop yield. We explored and analyzed peer-reviewed literature to provide an understanding of current and emerging trends in the field. A bibliometric method was followed using the database Scopus. Search queries used to retrieve documents were "Agriculture/crop productivity" and "Plant stress". The study period was restricted to the last five years, from 2017-2021. The search query found 2207 documents in Scopus under the agriculture and plant stress theme. Increasing growth of publications was observed in successive years. Research activities in this field have the most contributors from Asian countries – China and India followed by the US. The major stresses affecting agricultural productivity being investigated were-Water stress, Temperature stress, Salinity stress. Amongst these, the theme related to water stress/ precipitation/ drought stress was the most investigated. The availability of water has a pivotal role in sustainable agriculture. The use of conservation agricultural practices such as intercropping, no-tillage, and soil mulching has proven to be effective in retaining soil water content and reducing the dependency on irrigation, especially in rainfed areas, thereby assisting in drought mitigation and increasing crop yield. Precision agriculture approach employing satellite data to predict weather and rainfall and early detection of stress signals using hyperspectral reflectance has shown promising results in ensuring sustained productivity. Breeding and transgenic approaches for plants with higher water use efficiency (WUE) and the ability to tolerate water stress are key areas of research being followed throughout the world.

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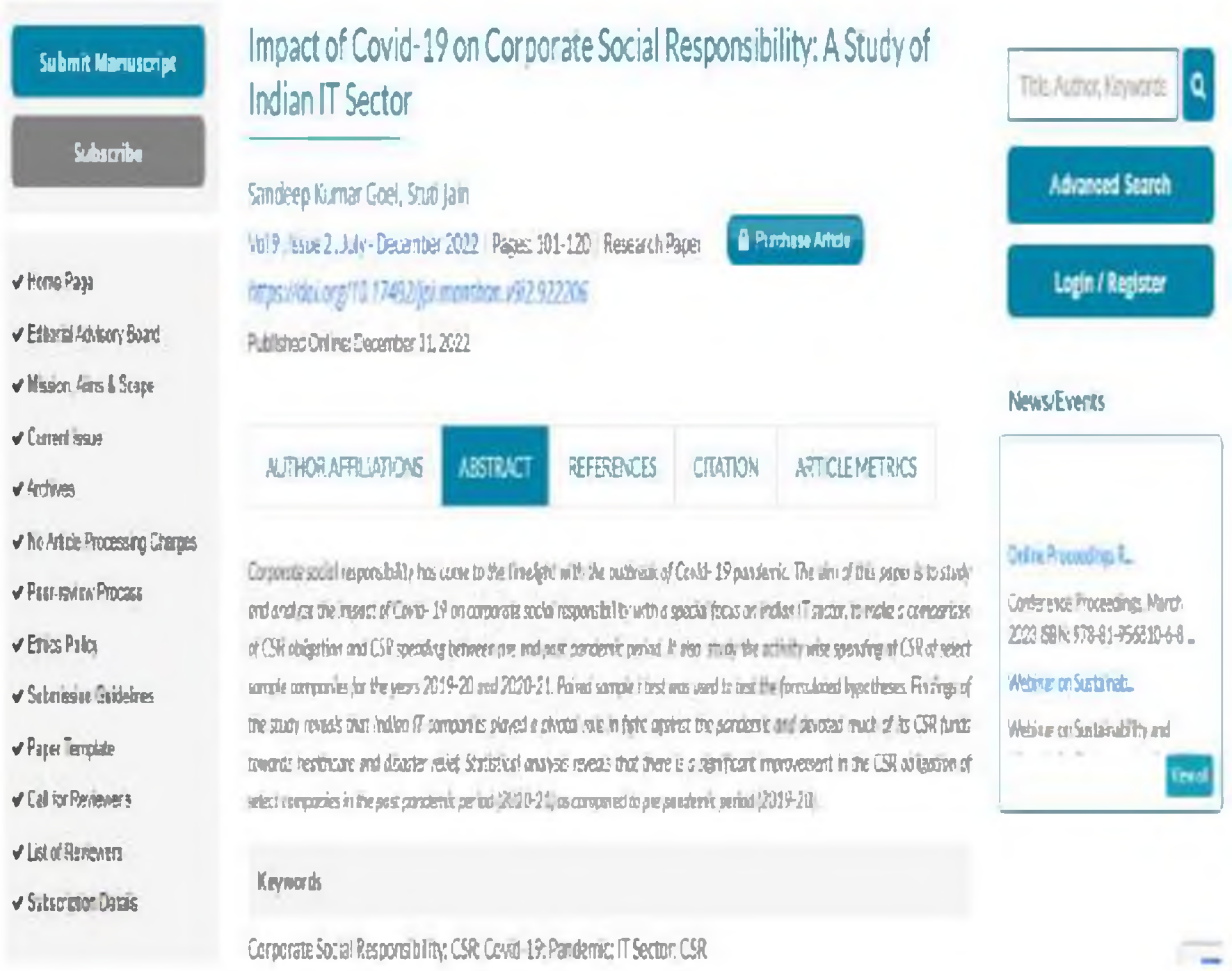

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Impact of Covid-19 on Corporate Social Responsibility: A Study of Indian IT Sector

Sandeep Kumar Goel, Stuti Jain

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Corporate social responsibility has come to the limelight with the outbreak of Covid- 19 pandemic. The aim of this paper is to study and analyze the impact of Covid- 19 on corporate social responsibility with a special focus on Indian IT sector, to make a comparison of CSR obligation and CSR spending between pre and post pandemic period. It also study the activity wise spending of CSR of select sample companies for the years 2019-20 and 2020-21. Paired sample t test was used to test the formulated hypotheses. Findings of the study reveals that Indian IT companies played a pivotal role in fight against the pandemic and devoted much of its CSR funds towards healthcare and disaster relief. Statistical analysis reveals that there is a significant improvement in the CSR obligation of select companies in the post pandemic period (2020-21) as compared to pre pandemic period (2019-20).

Keywords

Corporate Social Responsibility; CSR; Covid-19; Pandemic; IT Sector; CSR

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Phool: Journey from Waste to Wealth

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Abstract

With increasing awareness about sustainable living, there are many entrepreneurs who think of innovative sustainable business models but are hesitant to take the initial steps as they are sceptical about the challenges that they may have to face in the journey and where to look for the solutions. Thus, there is a need to document the journey of successful green businesses right from the point when the idea clicked to its transformation in to successful business, their triumphs and low points and what kept them going. This will not only serve to give recognition to these entrepreneurs for their work but will also guide upcoming entrepreneurs. The present work is in this direction. The present case study seeks to document the journey of Phool.co. The objective of the present case study is to examine unconventional business model adopted the company, identify the challenges faced by the company and explore strategies adopted by company to overcome these challenges, and its key success factors.

All the data and information for the study has been collected from the company's website, published interviews of its founders and key managerial personnel. The study revealed that company was able to succeed due to its unique packaging and marketing model. Its ability to innovate new green products such as florafoam, and fleather gave it recognition across the globe. The research findings about the way the founders of Phool toiled day and night and crossed initial hurdles regarding procurement of raw material, technological innovation, and securing finances for the project will certainly serve as a guide to other green entrepreneurs go wholeheartedly in their quest for sustainable living. In future, the work can be extended to comparative study of some more such start-ups to get better understanding of challenges faced by such entrepreneurs and how to resolve these.

Key Words: *Green Businesses, Sustainability, Zero waste solutions, Innovations in Business, Green Manufacturing Processes, Sustainable Business Models, Environment Protection, Eco-friendly Businesses*

1. Introduction

Green entrepreneurs in India are changing the basic network of production, marketing and consumption through eco-friendly concepts utilizing innovative product designs, raw materials, process design and marketing policies. They are the people who recognize the links between innovation and sustainability and thereby develop a comparative advantage for their firms/companies by selling differentiated products and services based on their environmental benefits. They are playing a crucial role towards sustainable economies not just by devising innovative production/marketing

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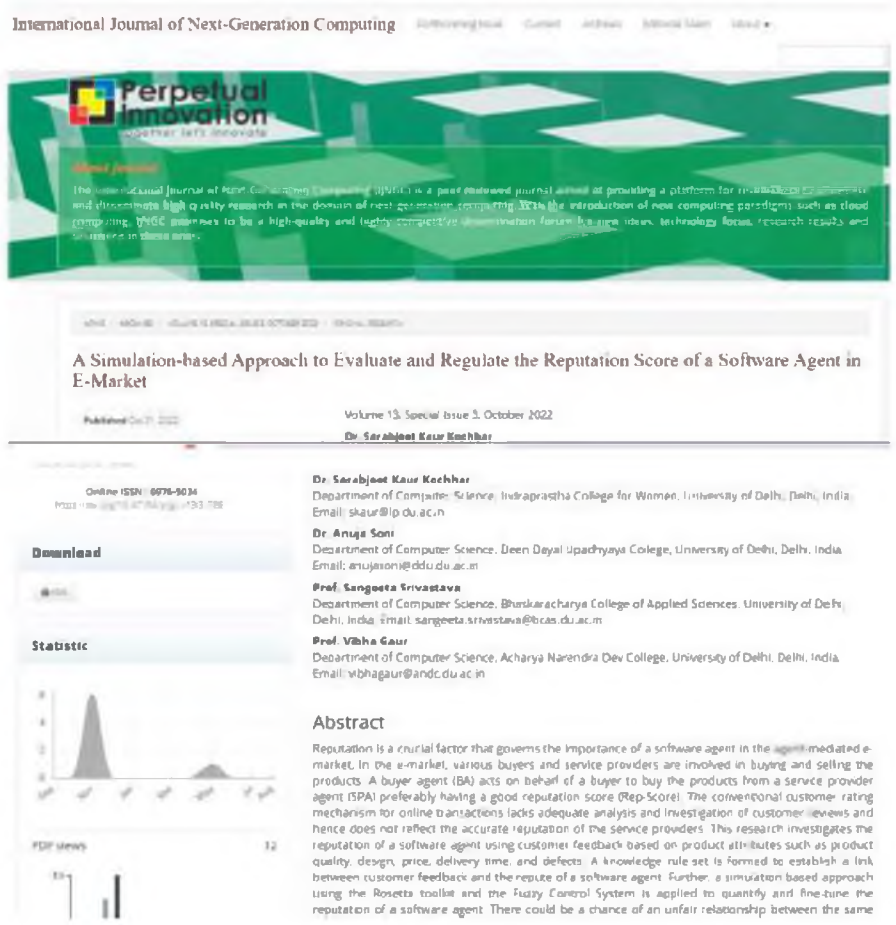

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Perpetual Innovation

A Simulation-based Approach to Evaluate and Regulate the Reputation Score of a Software Agent in E-Market

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Abstract

Reputation is a crucial factor that governs the importance of a software agent in the agent-mediated e-market. In the e-market, various buyers and service providers are involved in buying and selling the products. A buyer agent (BA) acts on behalf of a buyer to buy the products from a service provider agent (SPA) preferably having a good reputation score (Rep-Score). The conventional customer rating mechanism for online transactions lacks adequate analysis and investigation of customer reviews and hence does not reflect the accurate reputation of the service providers. This research investigates the reputation of a software agent using customer feedback based on product attributes such as product quality, design, price, delivery time, and defects. A knowledge rule set is formed to establish a link between customer feedback and the repute of a software agent. Further, a simulation based approach using the Rosetta toolkit and the Fuzzy Control System is applied to quantify and fine-tune the reputation of a software agent. There could be a chance of an unfair relationship between the same

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(R1985) Study the Effect of Modified Newtonian Force on the Restricted 3-body Configuration in Non-Linear Sense

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MEASURING COMPLEXITY AND CHAOS IN THREE-SPECIES FOOD CHAIN SYSTEM WITH THE BEDDINGTON-DEANGELIS FUNCTIONAL RESPONSE

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Three species food chain system with the Beddington-DeAngelis Functional response investigated for regular and chaotic evolutions under different feasible conditions in the framework of nonlinear dynamics. The Eulers method employed to transform the continuous model into discrete model. A number of bifurcation plots obtained by varying certain system parameters in turn while keeping other parameters constant. These diagrams show clearly regular evolution followed by chaos for certain range of changing parameter. Regular and chaotic attractors obtained for different parameter spaces. Numerical calculations further extended to calculate Lyapunov exponents (LCEs), topological entropies and correlation dimensions of chaotic attractors for different sets of parameter values. Results of obtained are presented through graphics and tables and analysed properly.

1. Introduction

Most of the existing real phenomena in nature are nonlinear and their evolutionary dynamical behavior often displays properties like unpredictability, chaos and complexity. Because of these researchers are attracted to carry more investigations on real phenomena. Population dynamics and ecological system problems are among those studied frequently. Investigations relating to problems of interaction between ecological populations, such as consideration of two-species continuous or discrete time evolution systems, in form

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2010 Mathematics Subject Classification: 37G15, 37D45.

Key words and phrases: bifurcation, chaotic attractors, Lyapunov exponents, topological entropy, correlation dimension.

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Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population

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Abstract: This study was aimed to investigate the long term change in quality of life post COVID-19 in all age groups from different parts of India. Three different survey methods were used to get in touch with COVID-19 survivors that included offline, online and telecommunication. Data was then categorized into three different categories as mild, severe and critical as per the level of severity of symptoms evaluated post-investigation. Individuals and area was treated as a random effect, with all covariates (age, sex, vaccination status, initial COVID-19 symptoms, level of severity of symptoms, time duration for which the symptoms lasted, post- recovery symptoms persisting more than 6 months, status of booster dose and safety precautions whether taken or not) treated as fixed effects. A total of 2600 individuals from various parts of India i.e. Delhi, Ghaziabad, Faridabad, Dehradun, Bangalore, Rajasthan, Tamil Nadu and Kerala were interviewed during the study. 602 positive cases were found with 255 individuals with mild symptoms, 273 severe symptoms, 72 critical cases and 2 special cases.

Results highlights the influence of COVID-19 on longer run, symptoms may resolve over time however, the influence of health on daily activities, work, and social activities may not. Through this communication we also highlights the fact that though COVID-19 has slowed down its infection rates but still precautions needs to be taken and various social programs should be organized to encourage people for booster dose.

Keywords: COVID-19, Symptoms, Health, Survey, Vaccination, Recovery, Precautions, Health

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Introduction

A bunch of analogous cases of pneumonia were recognized by the Chinese officials on 29th December 2019 in the Wuhan city of China. Soon the causative agent for these increased incidences of pneumonia was found to be novel coronavirus which was later named SARS COV 2 (Zhu *et al.*,

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Re-characterization of Potential Zoonotic Trematode Parasite Parasitizing Intestine of Snakehead Fish, (*Channa striata*) Utilizing Multiple Sequence Alignment Tools (MSA)

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Abstract: Metacercariae of *Clinostomum* Leidy, 1856 are frequently encountered in freshwater fish. The species configuration and taxonomic antiquity of the genus *Clinostomum* has been very unsteady and under discussion. Two species, i.e. *Clinostomum complanatum* Rudolphi, 1814 and *Clinostomum marginatum* Rudolphi, 1819, have been specifically troublesome and their taxonomic validation has been debated. 19 human incidences of *Clinostomum complanatum* have been reported to cause pharyngitis and lacramalitis from Japan, Thailand and Korea. *Clinostomum marginatum* is commonly known as yellow grub as it causes pinhead sized lumps in fishes that are white to yellow or black. In the present communication, we have made use of cytochrome oxidase c subunit 1 gene as DNA barcode for validating the taxonomy of *C. complanatum* and *C. marginatum* harboring phylogenetic studies and multiple sequence alignment tools. Currently, in India species of this group are distinguished mainly on the basis of morphological characters that underlie possible confusions. Therefore, we disinterred the species through molecular analysis. The current findings are salient to authenticate the phylogenetic place and relationship among two trematode spp. and bypass misidentification regarding their validation, as it is more necessary in that case when many species harbours the same host and are of zoonotic importance.

Keywords: Zoonotic, Helminth, *Clinostomum complanatum*, Taxonomic, Cox1, molecular, *Clinostomum marginatum*

Citation: Chauhan Bhumika, Misra Monica and Sharma Bindu: Re-characterization of potential zoonotic trematode parasite parasitizing intestine of snakehead fish, (*Channa striata*) utilizing multiple sequence alignment tools (MSA). Intern. J. Zool. Invest. 8(2): 475-483, 2022.

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Introduction

The global aquaculture production has exceeded 91.4 million tons and generated an average income of more than US$ 145.4 billion (Aohagi *et al.*, 1992; Sosa *et al.*, 2016). Aquaculture has served as a prominent key factor in the economy of India. Increased parasitism and disease outbreaks have negative impacts not only on the fish production, but also leads to economic losses.

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Impact of Climatic Change on Respiratory Health

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Abstract: Threatening effects of climate change are widely visible to the entire population. Though known to all, its adversity is understood only by a handful. With this study, we aimed to broaden its reach. Aiming at creating a louder voice of climate change, we wish to enlighten people about the adverse health effects it has in store for us. While reasons and results may be innumerable, yet precautions are few. Innumerable unknown repercussions have been approximated as well. Naturally occurring gases like carbon dioxide, nitrogen oxides and black carbon cause air pollution which aggravates allergenicity of plants causing earlier and longer pollen seasons. This worsens the situation for people already prone to asthma, allergens and other respiratory tract infections. Additionally, climate changes can exacerbate the issue evermore. Though the effects are perceptible, the reasons and cures are still being studied extensively.

Keywords: Climate, Pollution, Respiratory diseases, Asthma, COVID-19

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Introduction

Climate change is a constantly aggravating situation which is hidden from none. The long-term effects which lead to changes in temperature and rainfall patterns are appertained to climate change. It is a global havoc created by man-made interventions. A change in climate has caused widespread problems and has put earth's ecosystem and life of unborn generations in trouble. The visible effects have grown dramatically over the past few years and it has been estimated that it will grow fourfold in the next ten years if the present rates of deterioration continue. As per UN reports, an increase of 1.5°C in global temperature would help maintain survivable conditions but an estimate of 3.2°C increase has been drawn based on current climate plans.

Contrary to popular belief, climate change is not only about rising temperatures. It encapsulates fervent droughts, famine, dreadful

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PCR primer design for mitochondrial cox-1 gene from *Clinostomum complanatum* towards diagnosis

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Abstract:
Metacercariae of *Clinostomum* Leidy, 1856 are frequently encountered in freshwater fish. *Clinostomum complanatum* is a digenetic zoonotic parasite harbouring the intestine and body cavity of the fishes. 19 human incidences of *Clinostomum complanatum* infection have been

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REVIEW ARTICLE

A Literature Review on Reckless and Hazardous Contraceptive Practices used since Primeval Times

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ABSTRACT

Historians have extrapolated that primitive society used a diversity of methods to restrain populations such as physical segregation of men and women, infanticide and rallying of practices that would prevent pregnancies. The lack of education, perceived stigma from friends, alienation from parents and stringent financial implication were some of the utmost reasons considered as major drawback that leads to unplanned pregnancies and turning out with severe deadly consequences. The authors in the present communication accentuates the usage of harmful elements like lead, arsenic , plastic bags, oils , honey ,etc as method of contraception in ancient times that was absolutely not only myths but also hazardous. The utility of few herbal plants had already proved to have 100% effectiveness on birth control in distinct animal groups but still there usage remains unseasoned in humans. The authors also spotlights on the fact that certain authentic research is still needed to substantiate the use of herbs as natural mode of birth control as the present day practices of oral contraceptives (OC) retain hormonal imbalances and side effects.

Keywords: Contraceptive , women , fertility, birth control , sperm, human.

INTRODUCTION

In spite of the accessibility of secure and potent forms of contraception till today, societies in both developing as well as the developed world endure from unsatisfactory elevated rates of coincidental and nasty pregnancies. Though much progress has been made in recent decades in fertility abstraction in developing countries but still around 120 million (10–12%) married women in many regions and also more than 24% in sub-Saharan Africa, persevere to report an envious demand for contraception(Sirtuk Ware *et al.*,2013).The expeditious hike in the population growth has remarkably expanded the number of individuals per family and many cases of serious shortage of food and shelter have been reported that eventually leads to high maternal and infant mortality.

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RESEARCH ARTICLE

Role of A Evolutionary Conserved Hypothalamic Neuropeptide: Neuropeptide Y (NPY) in Release of Gonadotropin and Anterior Pituitary Hormones in Different Animal Groups

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ABSTRACT

The neuroendocrine control of gonadotropin secretion is attained by the ensemble of Luteinizing Hormone Releasing Hormone (LHRH) secreting neurons that are distributed within the anterior hypothalamus. These neurons are the main element of hypothalamo-hypophysiotropic association and their activity in turn is modulated by neurotransmitter or peptidergic synaptic inputs. In recent years, considerable attention has been focused to evaluate the role of neuropeptides that have been identified in the Central Nervous System (CNS) especially in the hypothalamus. Some of the neuropeptides of the hypothalamus modulate the release of LHRH and which in turn regulates the LH release. One such peptide released from the hypothalamus is Neuropeptide- Y, that acts as both neurotransmitter and neurohormone with multiple diverse effects like stimulation of feeding, inhibition of sex behaviours and modulation of cardiovascular parameters .Its role has also been found in severe stress and pathogenesis of bulimia ,low renin hypertension and in Alzheimer's disease which further signifies the importance of its study. NPY shows high degree of conservation throughout evolution .The present review is on the effect of Neuropeptide- Y on the levels of GnRH with major effects on LHRH .

Keywords: neuropeptide , hypothalamus , NPY , neurons , LHRH , LH ,FSH ,GnRH.

INTRODUCTION

Neuropeptides are small sized disparate group of hypothalamic signaling molecules that plays a significant role in communication among the cells in the central nervous system (CNS) and also a crucial role in cell-to-cell

Monkeypox: Endemic to Epidemic
A review of the current scenario of Monkeypox disease outbreak

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Abstract - The recent outbreak of Monkeypox disease in different parts of the world has drawn attention and concerns of the scientific communities, medicine world and the governments. The world has witnessed what havoc a virus can cause if it jumps from an animal to human beings. Are we moving towards the next pandemic? How safe are the use of animals in medicine and biological research? What will be the consequence of this new zoonotic disease? To avoid another pandemic, it is important that we watch the progress of this disease closely and understand the causes, consequences, treatment, and possible control before it gets out of hands. This article is a compilation of all the information about Monkeypox disease that is available in different domains, to give an overview of the current scenario of the disease.

Index Terms – Monkeypox, virus, MPV, epidemiology of MPV

I. INTRODUCTION

Monkeypox is a viral, zoonotic (transmitted to human from animals), and rare disease that is caused by infection with monkeypox virus (MPV or MPXV) with symptoms close to smallpox but not as severe as smallpox. Monkeypox was first discovered in 1958, when outbreaks of a pox-like disease occurred in monkeys used for research. About a few thousand cases occurred in Africa especially in central and western parts of the African continent [1]. The cases outside Africa were limited to a small number with a travel history of people visiting Africa or with the import of the infected animals.

In 1970, the Democratic Republic of the Congo reported the first human case of monkeypox. Since then, many cases have been reported from various central and west African countries. Most cases are reported from poorest and most marginalized communities in the world. [2][3]. Incidents of MPV infections are on a rise since early May 2022. About 19 countries across the world have reported confirmed or suspected cases of monkeypox to the WHO. Since the reports are from different parts of the world, this can no longer be considered endemic to the African region [14].

The cases detected outside the endemic places in the early May 2022 has surpassed the total number detected and this rapid spread has put the scientists worldwide on high alert. There has been a sudden and unexpected occurrence of monkeypox simultaneously in many non-endemic countries, which suggests that there is a possibility of some undetected transmissions for an unknown duration of time followed by recent amplifying events [14].

Epidemiological investigations are going on, however, from the various cases that are reported, so far, no established travel links to endemic areas has been established. Based on currently available information, a unique observation has been established which highlights the possibility of the spread of the disease, mainly but not exclusively, amongst men who have sex with men (MSM) and are seeking primary care in primary clinics or sexual health clinics. A scientific clinical link has yet to be established.

II. WHAT IS MPV?

Monkeypox virus is a double stranded DNA virus which belongs to genus *Orthopox virus* belonging to the Poxviridae family. The *Orthopox virus* genus also includes variola virus responsible for smallpox and cowpox virus. Various animal species have been known to be susceptible to the monkeypox virus. The natural reservoir of monkeypox has been a question of interest from many scientists since its discovery. However, it has been detected from rodents of African region, non-hominids primates such as monkey (hence the name "Monkeypox"). Further research is needed to know the exact reservoir/s of the virus and the route of its entry into the human population.

III. PATHOGENESIS

Pathogenesis is the progression of an infection which leads to disease. The general viral pathogenicity includes (a) implantation of virus at the portal of entry, (b) viral replication in the host cell [3], spread of viral agent to target organs causing the disease and (c) migration of virus to sites of shedding into the environment.

Factors that affect the pathogenic mechanisms are (a) accessibility of host tissue to the virus (b) host cell susceptibility to virus multiplication, and (c) virus susceptibility to host defences. Low-virulent strains of pathogenic virus strains are favoured by natural selection forces.

In case of monkeypox, infection may begin from the respiratory epithelium or the dermis. The virus further progresses and enters the lymphatic system leading to the swelling of the lymph nodes. Other organs that are susceptible to infected are mucus lining of nose and buccal cavity.

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IN VITRO MICROPROPAGATION OF *ACACIA HOLOSERICEA* A. CUNN. EX G. DON THROUGH COTYLEDONS

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Abstract

Cotyledonary explants were excised from 15-day-old seedlings of *Acacia holosericea* A. Cunn ex G. Don and cultured on B_5 medium supplemented with different growth regulators. Caulogenesis was observed both directly and indirectly in different cytokinin adjuvanted media. Of all the cytokinins tested, zeatin supported maximum multiple shoot differentiation. Friable to compact nodular green calluses developed at cut ends of explants and on their surface within 15-20 days of inoculation. Caulogenesis was observed only after 40-45 days of initial culture, and an average of 4.3±2.7 shoots per explant were formed on 2.5 mg/l zeatin containing B_5 medium in 40% of explants. The addition of 200 mg/l Ad.S enhanced the percentage of explants forming shoot buds to 50 and raised the number of shoot buds per explant to 12.0±6.8. Cent percent of the *in vitro* raised shoots when excised and subcultured on B_5 basal medium, developed roots directly at their base.

Keywords: *Acacia Holosericea*, Cotyledons, Fabaceous Tree, Micropropagation

Abbreviations: Ad.S., Adenine Sulphate; B_5, Gamborg Et Al Medium; BA, N^6-Benzyladenine; 2ip, (6-Dimethyl Allylamine)-Purine; Kn, Kinetin.

Introduction

The last three decades have witnessed a large proportion of forests being denuded. The availability of land for crop production is gradually shrinking at an alarming rate due to industrialization, urbanisation, etc. The environment has been strikingly degraded both in rural and urban areas. Maintenance of higher living standards, obviously, always craving for much more than required consumption of natural resources have been the chief cause for environmental degradation in the urbanised world, whereas it is poverty and overpopulation in rural areas which have led to the degradation of the environment in the developing countries. Hence, reforestation is an urgent priority for mitigating such hazardous and catastrophic developments. This can be done by planting trees that are multipurpose, fast-growing, high-yielding, capable of withstanding abiotic and biotic stresses, resistant to diseases and pests as well as have the ability to fix atmospheric nitrogen directly, ultimately acting as artificial fertilisers[1][2]. Some such woody species are the leguminous trees, whose potential has been recognized the world over. There has been a conspicuous lacuna in the axenic morphogenesis due to their recalcitrant nature under *in vitro* conditions. However, it has now been possible to micropropagate some of the most valuable woody legumes such as *Acacia*, *Albizia*, *Dalbergia*, *Prosopis*, etc.

Acacia holosericea A. Cunn. Ex G. Don, is a native of Australia and was introduced in India for afforestation projects. It is a small tree, well adapted to a wide range of harsh habitats in arid lands, and plays a significant role in the revegetation of denuded lands. The tree grows well even under environmentally stressed conditions such as water scarcity, low nutrients and high levels of salinity. It is also known to be responsible for altering the soil microbiota by modifying the structure of Arbuscular Mycorrhizal fungal communities [3]. Besides being adaptable to arid regions, it is often grown as an ornamental tree [4]. This tree taxon has appreciably high productivity, useful for biochar, bio-oil and biogas production [5]. It grows profusely which makes it not only suitable but also important for introduction in Indian deserts [6]. The present study reports micropropagation of *A. holosericea* through the cotyledonary explants.

Materials and methods

Seeds of *Acacia holosericea* were soaked in concentrated sulphuric acid for 30 min. and surface sterilised by treating with freshly prepared chlorine water for 45 min. Chlorine was obtained by adding 30 ml of concentrated hydrochloric acid (LR) to 4 g of potassium permanganate. The chlorine water was prepared by bubbling chlorine in 500 ml of distilled water for 15-20 min. Thereafter, the seeds were washed thrice with sterilised water and implanted aseptically on semi-solid Knop's medium [7].

Cotyledons were excised from 15-day-old *in vitro* raised seedlings and cultured on B_5 [8] medium either alone or supplemented with growth regulators such as cytokinins and/or auxins. In addition, a few adjuvants such as adenine sulphate and coconut water were also tried.

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AXENIC PROPAGATION OF A WOODY LEGUME - PROSOPIS CINERARIA (L.) DUCE THROUGH COTYLEDONARY NODE EXPLANTS

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Abstract: Cotyledonary node explants of Prosopis cineraria (L.) Duce were excised from 10-day-old seedlings grown in vitro on Knop's medium [1] and cultured on Murashige & Skoog medium [2] supplemented with various cytokinins like N^6-benzyladenine, (6-dimethyl allylamine)-purine, kinetin or zeatin. Maximum number of shoots developed in 63% explants on 11µmol (2.5mg/l) N^6-benzyladenine adjuvanted MS medium after 60 d of culture. The adventive shoots differentiated in the axil of cotyledons. 89% shoots formed roots within 20-25d when subcultured on MS medium supplemented with 13.2µmol (3mg/l) indole-3-butyric acid. The plants developed in vitro were gradually transferred to the soil.

Keywords: Cotyledonary Node, Fabaceous Tree, Micropropagation, Prosopis Cineraria.

Abbreviations: AC, activated charcoal; B_5, Gamborg et al.'s medium; BA, N^6-benzyladenine; 2iP, (6-dimethyl allylamine)-purine; F.A.A., Formalin-acetic acid-alcohol; IAA, Indole-3-acetic acid; IBA, Indole-3-butyric acid; Kn, Kinetin; MS, Murashige & Skoog medium; NAA, α-Naphthalene acetic acid; NOA, β-Naphthoxyacetic acid.

Introduction

Micropropagation of trees is being increasingly recognised as a potential bypass technology for rapid afforestation to achieve enhanced biomass production. In addition, it offers means not only to conserve elite and rare tree germplasm but also for bringing about their genetic improvement. Prosopis is an important multipurpose fabaceous tree of arid tropics and has several species of value, predominant in the Thar desert. Though considered as a problematic and recalcitrant species to in vitro regeneration, during the past few years, a few reports with limited success have appeared employing both juvenile and mature explants [3,4,5].
The present investigations were undertaken to develop a protocol for micropropagation of a fabaceous taxon Prosopis cineraria, which is one of the two tree species that serve as lifeline for inhabitants of drier regions of Rajasthan in India.

Material and Methods

Seeds of Prosopis cineraria belonging to subfamily Mimosoideae were obtained from the Central Arid Zone Research Institute, Jodhpur, India. They were scarified and soaked in distilled water for 8hr at room temperature and surface sterilized with freshly prepared chlorine water (3.5±0.5mg/l) for 45min. Chlorine was obtained by addition of 30ml of concentrated hydrochloric acid to 4g of potassium permanganate. The chlorine water was prepared by bubbling chlorine in 500ml of distilled water for 15-20min. Thereafter, the seeds were washed three times with sterilized distilled water and germinated aseptically on Knop's medium containing 2% sucrose (British Drug House, Poole, England) and 0.8% agar (Hi-media, Mumbai, India). The pH of media was set at 5.8 before autoclaving at 121°C at 1.06 kg/cm^2 pressure for 15min.

About 0.8-1cm long segments of cotyledonary node were excised from 10-day-old seedlings and cultured on MS basal medium alone as well as adjuvanted with cytokinins (BA, Kn, 2iP or zeatin) at 0.5 to 3mg/l levels. The media contained 3% sucrose and 0.8% agar. Cultures were maintained at 25±2°C and 55±10% relative humidity under white fluorescent light at 40µ cEm^{-2}s^{-1} irradiance emitted by 40W Crompton incandescent tubes programmed for 16 hr photoperiod. Explants were subcultured on a fresh medium after every 25-30 days and data were recorded at an interval of 10-15d. The final data were scored after 60d of culture. The in vitro reared shoots were excised and reared on MS medium supplemented with 1-3mg/l auxins (IAA, IBA, NAA or NOA) for root induction. A minimum of 30 replicates were raised for each treatment and all experiments were repeated at least once. The average number of shoots per responding explant has been represented as mean value indicating the standard deviation (mean±S.D).

For histological studies, tissues were fixed in F.A.A. and dehydrated through a graded ethanol-xylene series, followed by infiltration and embedding in paraffin wax. Serial sections, 20-25µm thick, were cut with a rotary microtome and affixed to slides. These were dewaxed, stained with safranin-fast green combinations, dehydrated and mounted in canada balsam. Photomicrographs were taken by a 35mm camera attached to the Leitz Orthoplan Universal Microscope.

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Research Article

SYNTHESIS, CHARACTERIZATION AND APPLICATION OF NOVEL GUAR GUM-N,N-DIMETHYLANILINE RESIN FOR WASTE WATER TREATMENT

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Guar gum polysaccharide, ion exchanger, heavy metals, N,N-Dimethylaniline, pH, Chelating Complexes, Treatment Time, Treatment Temperature.

ABSTRACT

The polymeric ion exchange resin has found extensive applications in recovery and removal of transition metal ions from process solutions due to their selectivity particularly against alkali metal ions. The ion exchanger based on guar gum is hydrophilic and biodegradable, whereas ion exchangers prepared from petrochemical products are hydrophobic and not biodegradable. Its cost is low, locally available in large quantities from agricultural resources and is environment friendly. N,N-Dimethylaniline group has been incorporated in Guar gum based polysaccharide by a modified Porath's method of functionalization of polysaccharide in order to develop a hydrophilic, flocculants cum ion exchanger. The characterization of synthesized resin [GGMA] was carried out by FT-IR spectrum, moisture content, ion exchange capacity, solubility of resin in different solvent, resin durability and elemental analysis. The adsorption of different metal ions on GGMA resin follows the order: Fe > Cu > Zn > Cd > Pb . The adsorbency of different metal ions on GGMA resin was studied up to 10 cycles. The effects of pH, treatment time, treatment temperature, and resin dose on the removal of metal ions from industrial effluent were also studied. The GGMA resin was found to be applicable for the removal and recovery of heavy metal ions from Faridabad ground water.

INTRODUCTION

Water pollution due to hazardous heavy metals has been a major global concern for us. Heavy metal ions not only reach surface water but also contaminate ground water in trace amounts by leaching from soil after rain. Heavy metals are detected in ground water. Water pollution affects plants and animals living in these bodies of water as well as human communities that use the polluted water. The removal of heavy metal ions from waste water can be achieved by several processes, such as precipitation, solvent extraction, chemical, electrochemical techniques[1] and advanced oxidation process[2]. The presence of lead, cadmium and other heavy metals ions in the environment has become a major threat to plant, animal and human life due to their bioaccumulations tendency and toxicity, therefore must be removed from municipal and industrial effluents before discharge.

A number of chelating ion exchange resins have been produced by resin manufacturers to overcome this problem and to encourage ion exchange to a broader range of processing solutions using high capacity cation and anion exchange resins with metal complexing effluents[3,4].

The separation of many transition and post transition metals was accomplished using various ion exchange resins [5]. Ion exchange method during the last decade has become increasingly important in various analysis in organic and inorganic chemistry [6-8]. Ion exchange process has been recognized as a powerful tool in separation, purification and metal recovery systems. The process involves a reversible exchange of ions which takes place between liquid and solid phase of ion exchangers during two sequential processes, adsorption/metal loading and elution. Adsorption/metal loading is interpreted as the extraction process in which the targeted ions from the liquids are exchanged with mobile ions from the ion exchangers [9]. The interest in the chelating resins or ion exchange resins is due to the rapid adsorption of metal ions, higher selectivity and less swelling, in comparison with the analogous organic polymer. Chemically, guar gum (Figure 1) is a polysaccharide composed of the sugars galactose and mannose. The backbone is a linear chain of β 1, 4-linked mannose residues to which galactose residues are 1, 6-linked at

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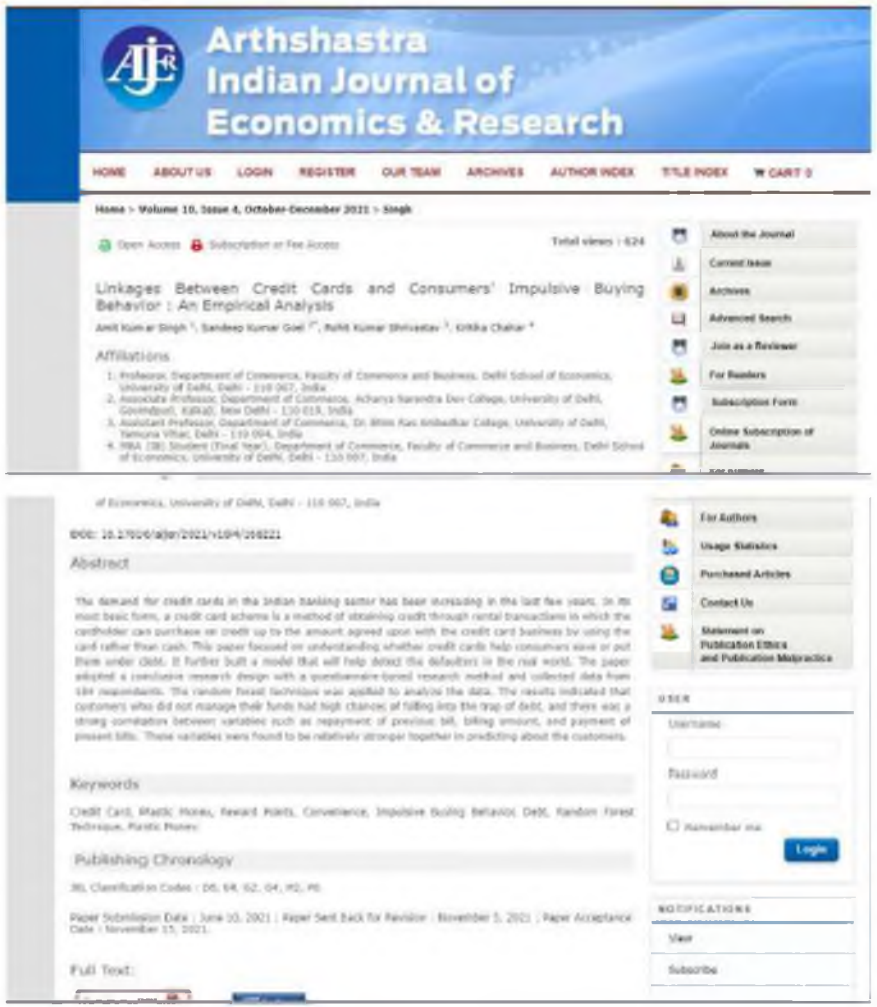
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Review

Antibiotic Resistance: A Global Health Crisis

Renu Solanki[1] · Shailly Anand[1] · Mugdha Anand[2] · Prateek Kumar[1] · Munendra Kumar[1] · Monisha Khanna Kapur[3]*

Received: 10 September 2021 / Accepted: 14 October 2021 / Published online: 18 February 2022

Abstract

Antimicrobial Resistance (AMR) has been recognized as a global health crisis. It occurs when the microbial pathogens develop mechanisms by means of which the existing antibiotics become ineffective against them and the management of infections caused by them become difficult. According to the data of World Health Organization (WHO) the most common multidrug resistant (MDR) microbes include *Mycobacterium tuberculosis*, *Neisseria gonorrhoeae*, *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Pseudomonas aeruginosa*, *Clostridium difficile*, *Klebsiella pneumoniae* and many more. Overpopulation, globalization, misuse of antibiotics by humans, injudicious use of antibiotics in livestock, poor hygiene standards in hospitals and lack of development of new antibiotics constitute the major causes for the rise in antimicrobial resistance. Although, the development of new antibiotics is considered as a potential solution to tackle the spread of AMR; newer alternative strategies including vaccines, bacteriophages, monoclonal antibodies, other bioactive molecules like peptides and development of effective diagnostic tools are also being explored by scientists to overcome this issue. This global concern thus requires collaborative efforts from countries across the world. Therefore, different organizations like World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), Infectious Diseases Society of America, World Economic Forum are working tirelessly towards the control of AMR.

Keywords: Antibiotics, anti-microbial resistance, health, global challenge

Introduction

Antibiotics are the chemical substances which kill or stop the growth of microbes including bacteria and fungi. On the basis of their mode of action, antibiotics are divided into two broad categories [1]:

(i) Bacteriostatic: These antibiotics prevent the bacteria from multiplying further mainly by hampering the cell wall synthesis.

(ii) Bactericidal: These antibiotics kill the bacteria by preventing the DNA replication, protein synthesis or by affecting other metabolic pathways (Figure 1).

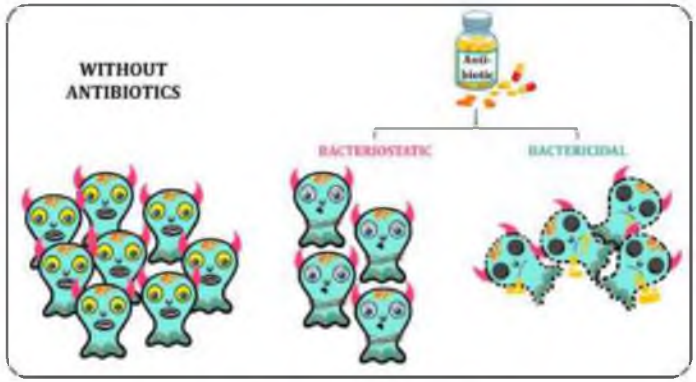

Figure 1: Bacteriostatic and Bactericidal antibiotics

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Review

Role of abiotic and biotic components in remediating environmental pollutants: A review

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Received: 8 September 2021 / Accepted: 1 December 2021 / Published online: 18 February 2022

Abstract

Increasing environmental pollutants due to various anthropogenic activities are of great concern nowadays since they affect the health of both terrestrial and aquatic ecosystems. Pollutants such as pesticides, heavy metals, fertilizers are non-biodegradable and persist in the environment for a longer duration affecting the health of living organisms. In this context, bioremediation technology is gaining considerable attention. Bioremediation technology involves various living organisms for the removal of toxic pollutants. This review discusses detoxification methods adopted by various microorganisms. An attempt has also been made to understand how these detox-mechanisms can be exploited to clean up the environment in a natural way. Finally, various environmental factors that regulate bioremediation processes and the methods to improve the rate of bioremediation have been mentioned. This comprehensive study may help to understand the fundamental aspects and future perspectives of microbial remediation of pollutants which could help in commercial success of waste management processes.

Keywords: Bioremediation; Biotechnology; Detoxification; Environmental pollution; Microbes

Introduction

Environmental pollution is of great concern worldwide due to increasing industrialization, urbanization, mining, usage of agro-chemicals and other anthropogenic activities [1]. Pollutants including both organic and inorganic compounds such as fertilizers, pesticides, heavy metals, herbicides, insecticides, greenhouse gases, hydrocarbons, oil, dyes, nuclear wastes, e-waste, etc. are reported to contaminate terrestrial and aquatic environments [2, 3]. These pollutants are known to enter the food chain of various living organisms causing adverse effects [4]. To control this prevailing condition, many research studies are being conducted to clean-up or reduce the increasing environmental pollutants [3]. Previously, the pollutants or wastes were disposed of in a traditional manner where they were dumped by digging holes [5]. But this method of waste management has become very difficult and unsuccessful due to increasing demand for new places every time to dump the rapidly increasing environmental waste. Nowadays, microbial remediation is gaining attention since it is considered to be a successful cleaning or waste management technique, where the microorganisms are predominantly involved in detoxifying the environmental contaminants [6]. Thus, bioremediation is commonly defined as a biological mechanism that helps in recycling toxic wastes to non-toxic compound by any of the process such as degradation, eradication, immobilization, or detoxification [6]. Since bioremediation processes are environmental and budget friendly in relation to other physical and chemical methods, they have come into extensive usage in remediating technologies [3, 6]. Bioremediation technology generally employs various microorganisms which include bacteria, ciliates, algae and fungi [3]. The versatility of microbes with respect to their nutritional demands and also their metabolic activity confers them the ability to survive even in the harsh environmental conditions and contribute efficiently in bioremediation [2].

This review focuses on various microbial detoxification processes that help in altering the toxic pollutants to non-toxic materials by exhibiting a unique array of mechanisms. This review also talks about the abiotic factors which play predominant role in determining the biodegradation rate of pollutants and about various methods involved in regulating these abiotic factors for proper microbial activity. In addition, the limitations/challenges of bioremediation have been discussed. Thus, the current review will impart an updated information on the remediation strategies to remove environmental pollutants using microorganisms.

Detoxification mechanisms exhibited by various microorganisms

The various microorganisms used in bioremediation processes have been summarized in Table 1.

Following are the different mechanisms adopted by the microorganisms to detoxify the pollutants:

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Research Article

Estimation after selection from bivariate normal population with application to poultry feeds data

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Abstract

In many practical situations, it is often desired to select a population (treatment, product, technology, etc.) from a choice of several populations on the basis of a particular characteristic that associated with each population, and then estimate the characteristic associated with the selected population. The present paper is focused on estimating a characteristic of the selected bivariate normal population, using a LINEX loss function. A natural selection rule is used for achieving the aim of selecting the best bivariate normal population. Some natural-type estimators and Bayes estimator (using a conjugate prior) of a parameter of the selected population are presented. An admissible subclass of equivariant estimators, using the LINEX loss function, is obtained. Further, a sufficient condition for improving the competing estimators is derived. Using this sufficient condition, several estimators improving upon the proposed natural estimators are obtained. Further, an application of the derived results is provided by considering the poultry feeds data. Finally, a comparative study on the competing estimators of a parameter of the selected population is carried-out using simulation.

Mathematics Subject Classification (2020). 62F07, 62F15, 62C15

Keywords. Estimation after selection, bivariate normal distribution, improved estimators, LINEX loss function, natural selection rule

1. Introduction

The estimation of a characteristic after selection has been recognized as an important practical problem for many years. The problem arises naturally in multiple applications where one wishes to select a population from the available $k\,(\geq 2)$ populations and then estimate some characteristics (or parametric functions) associated with the population selected by a fixed selection rule. For example, in modeling economic phenomenons, often the economist is faced with the problem of choosing an economic model from $k\,(\geq 2)$ different models that returns a minimum loss to the capital economic. After the selection

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Implementation of an Adaptive Artificial Neural Network with Fuzzy Expert System for Diagnoses the Breast and Prostate Cancer: A Hybrid Technique(Article)

Kaur, K., Prasad, J.S., Arya, D.D., Krishna, H., Tarebe, V.B., Rajoria, Y.K., Boudh, R.

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Abstract

Expert systems for medical applications have emerged as a result of recent developments in artificial intelligence. Additionally, in the recent years, computational tools have been developed to enhance the knowledge and skills of doctors when it comes to making decisions regarding their patients. The second-leading cause of cancer-related death is breast cancer, which is the most prevalent malignancy in women. About one-third of women with breast cancer pass away from the condition, even though it is treatable when found early. One of the main causes of death in the globe is cancer. Prostate cancer is one type of cancer that claims lives among men. This study is to evaluate the model's accuracy to expert forecasts regarding prostate cancer. Based on patient prostate volume, age, and prostate specific antigen data, predictions are made. Due to the absence of a prostate-like appearance in women, this disease mainly affects men. However, it might be challenging to distinguish between benign and malignant mammographic results, therefore in this work, we designed an expert system for Diagnosis of Breast Cancer and Prostate Cancer. The findings demonstrate that the proposed fuzzy model can be used effectively to aid in the diagnosis and analysis of the possibility of prostate cancer and is one of the factors that doctors consider when determining whether or not a biopsy is necessary for these patients. The PCR value provided by the fuzzy model is within the PCR interval predicted by a specialist doctor. This technique makes it possible to avoid needless biopsy. Additionally, this technique can be useful for training medical students. © 2022 Wolters Kluwer Medknow Publications. All rights reserved.

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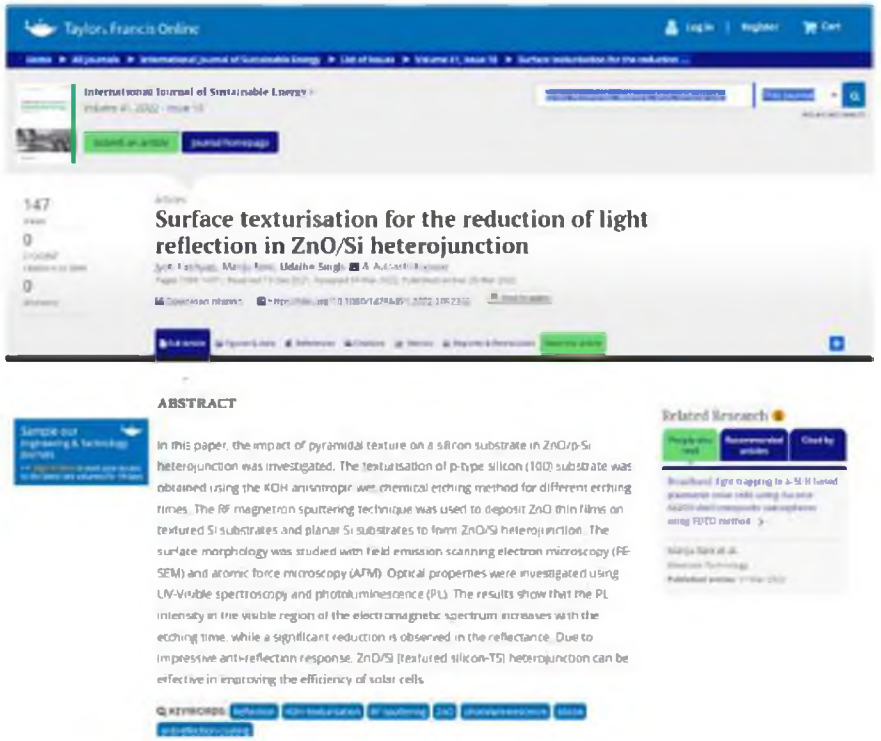
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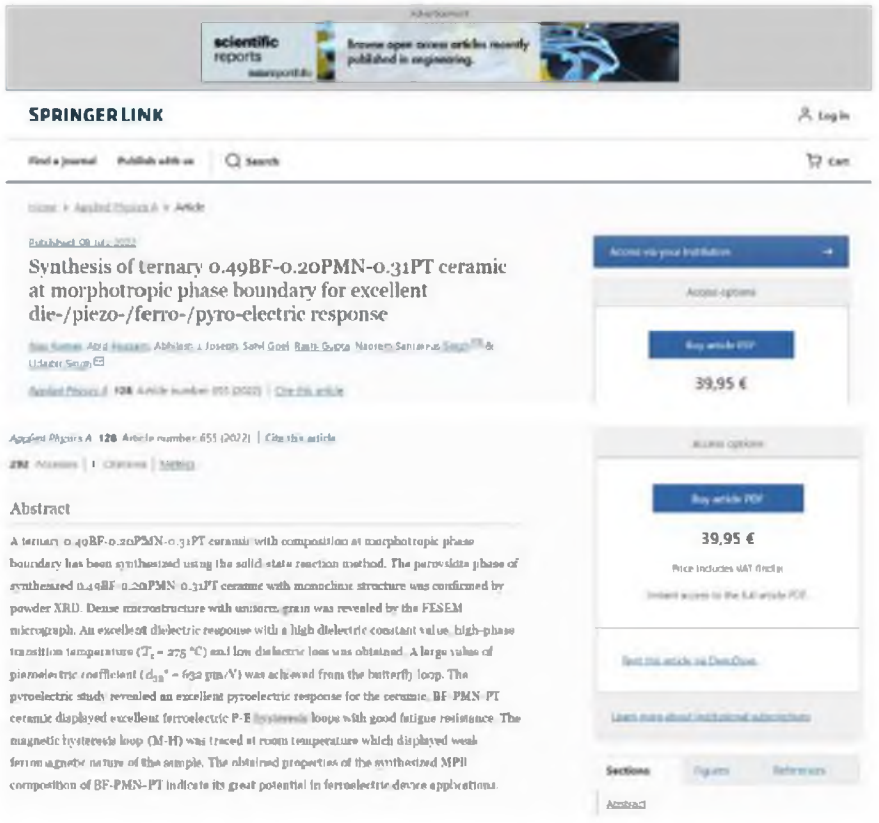
Surface texturisation for the reduction of light reflection in ZnO/Si heterojunction
ABSTRACT
In this paper, the impact of pyramidal texture on a silicon substrate in ZnO/p-Si heterojunction was investigated. The texturisation of p-type silicon (100) substrate was obtained using the KOH anisotropic wet chemical etching method for different etching times. The RF magnetron sputtering technique was used to deposit ZnO thin films on textured Si substrates and planar Si substrates to form ZnO/Si heterojunction. The surface morphology was studied with field emission scanning electron microscopy (FE-SEM) and atomic force microscopy (AFM). Optical properties were investigated using UV-Visible spectroscopy and photoluminescence (PL). The results show that the PL intensity in the visible region of the electromagnetic spectrum increases with the etching time, while a significant reduction is observed in the reflectance. Due to impressive anti-reflection response, ZnO/Si (textured silicon-TS) heterojunction can be effective in improving the efficiency of solar cells.
Related Research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Synthesis of ternary 0.49BF-0.20PMN-0.31PT ceramic at morphotropic phase boundary for excellent die-/piezo-/ferro-/pyro-electric response
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Abstract
A ternary 0.49BF-0.20PMN-0.31PT ceramic with composition at morphotropic phase boundary has been synthesized using the solid state reaction method. The perovskite phase of synthesized 0.49BF-0.20PMN-0.31PT ceramic with monoclinic structure was confirmed by powder XRD. Dense microstructure with uniform grain was revealed by the FESEM micrograph. An excellent dielectric response with a high dielectric constant value, high-phase transition temperature (T_c = 275 °C) and low dielectric loss was obtained. A large value of piezoelectric coefficient (d_{33}* = 632 pm/V) was achieved from the butterfly loop. The pyroelectric study revealed an excellent pyroelectric response for the ceramic. BF-PMN-PT ceramic displayed excellent ferroelectric P-E hysteresis loops with good fatigue resistance. The magnetic hysteresis loop (M-H) was traced at room temperature which displayed weak ferromagnetic nature of the sample. The obtained properties of the synthesized MPB composition of BF-PMN-PT indicate its great potential in ferroelectric device applications.
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Abstract

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Review

Recent Trends in Carbon Nanotube Electrodes for Flexible Supercapacitors: A Review of Smart Energy Storage Device Assembly and Performance

Himadri Tanaya Das [1,*], Swapnamoy Dutta [2], Tamilarasan Elango Balaji [2], Nigamananda Das [2], Payaswini Das [3], Neelu Dheer [4], Rajni Kanojia [5], Preety Ahuja [6] and Sanjeev Kumar Ujjain [6,*]

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Abstract: In order to upgrade existing electronic technology, we need simultaneously to advance power supply devices to match emerging requirements. Owing to the rapidly growing wearable and portable electronics markets, the demand to develop flexible energy storage devices is among the top priorities for humankind. Flexible supercapacitors (FSCs) have attracted tremendous attention, owing to their unrivaled electrochemical performances, long cyclability and mechanical flexibility. Carbon nanotubes (CNTs), long recognized for their mechanical toughness, with an elastic strain limit of up to 20%, are regarded as potential candidates for FSC electrodes. Along with excellent mechanical properties, high electrical conductivity, and large surface area, their assemblage adaptability from one-dimensional fibers to two-dimensional films to three-dimensional sponges makes CNTs attractive. In this review, we have summarized various assemblies of CNT structures, and their involvement in various device configurations of FSCs. Furthermore, to present a clear scenario of recent developments, we discuss the electrochemical performance of fabricated flexible devices of different CNT structures and their composites, including additional properties such as compressibility and stretchability. Additionally, the drawbacks and benefits of the study and further potential scopes are distinctly emphasized for future researchers.

Keywords: carbon nanotubes; flexible; energy storage; supercapacitor; nanocomposites

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Citation: Das, H.T.; Dutta, S.; Balaji, T.E.; Das, N.; Das, P.; Dheer, N.; Kanojia, R.; Ahuja, P.; Ujjain, S.K. Recent Trends in Carbon Nanotube Electrodes for Flexible Supercapacitors: A Review of Smart Energy Storage Device Assembly and Performance. *Chemosensors* **2022**, *10*, 223. https://doi.org/10.3390/chemosensors10060223

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1. Introduction

Development of flexible energy storage systems has improved in recent times, due to the rise in demand for next-generation technology. Recent technologies such as smart wearable and portable electronic devices have encouraged the utilization and further advancement of energy storage components such as supercapacitors or batteries [1–4]. To make existing or upcoming upgraded electronics slimmer, lighter, and more flexible, enhanced energy supply systems are necessarily required. Enhanced electronic devices or technologies which have exhibited great scope of application include electronic textiles, flexible displays, distributed sensors, artificial electronic skin, etc. [5–7]. However, researchers continue to search for promising energy storage systems to achieve desired features for more complex electronic devices [8–10]. Supercapacitors have potential for energy storage utilization in future electronics devices, owing to characteristics including

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In silico prediction of natural compounds as potential multi-target inhibitors of structural proteins of SARS-CoV-2

Jyoti Rani[a,b], Anasuya Bhargav[b,c], Faez Iqbal Khan[d], Srinivasan Ramachandran[b,c], Dakun Lai[d] and Urmi Bajpai[a]

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ABSTRACT

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has caused a colossal loss to human health and lives and has deeply impacted socio-economic growth. Remarkable efforts have been made by the scientific community in containing the virus by successful development of vaccines and diagnostic kits. Initiatives towards drug repurposing and discovery have also been undertaken. In this study, we compiled the known natural anti-viral compounds using text mining of the literature and examined them against four major structural proteins of SARS-CoV-2, namely, spike (S) protein, nucleocapsid (N) protein, membrane (M) protein and envelope (E) protein. Following computational approaches, we identified fangchinoline and versicolactone C as the compounds to exhibit strong binding to the target proteins and causing structural deformation of three structural proteins (N, S and M). We recommend the inhibitory effects of these compounds from our study should be experimentally validated against SARS-CoV-2.

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KEYWORDS
SARS-CoV-2; natural antiviral compounds; docking; simulation; COVID-19

Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) from the Coronaviridae family has created an unprecedented healthcare crisis (Khan et al., 2020). It has disseminated around the world with a mortality rate of 2.15% (22 July, 2021) (WHO). Further, the emergence of new variants of SARS-CoV2 and their high transmission rate has created an unparalleled disruption in human life and still poses a big threat to human health and global economy. In the past decades, several epidemics have been caused by coronavirus, which include SARS-CoV in 2003 with a mortality rate of 10% (Cheng et al., 2007; Lee et al., 2003) and Middle East Respiratory Syndrome (MERS) in 2012 with 35% mortality rate (de Groot et al. 2013; Zaki et al., 2012). The pathogenicity of SARS-CoV-2 is relatively less than SARS-CoV and MERS, but it is infectivity is higher than other harmless human coronaviruses (Dömling & Gao, 2020). The recent launch of several vaccines has opened the possibility of containing the infection and providing protection to a large populace. However, effective drugs for the treatment of infections caused by coronaviruses (Wu et al., 2020) are still not available and a hunt for drugs against SARS-CoV2 remains critical for the therapeutic interventions.

For discovery of new drugs, natural compounds serve as rich resources (Lin et al., 2014) and nearly a quarter of approved drugs have plant origins (Thomford et al., 2018). Several well-characterized natural compounds have been documented for their antimicrobial, anti-inflammatory and other beneficial effects on humans and animals thereby offering promising sources for drug development (Clark, 1996; El Sayed, 2000). Advancement in the synthetic biology also has accelerated the mass production of natural compounds (Chen et al., 2021). The ethno-medical literature has listed various herbal plants for their appealing antiviral activity (Ganjhu et al., 2015; Mukhtar et al., 2008; Potroz & Cho, 2015). Natural products include extracts from herbal plants, phytoconstituents, and precise extracts of seed, root, fruit, stem, and flower of plants (Boukhatem & Setzer, 2020; Rates, 2001). Several derivatives of medicinal herbs have been widely considered for antiviral activity (Ganjhu et al., 2015). Antiherpetic acyclovir', amoebicide 'emetine' and antimalarial quinine are good examples of drugs modeled on natural products (El Sayed, 2000; Ganjhu et al., 2015). Some of the medicinal plants have also shown antiviral activity against SARS-CoV-2 (Benarba & Pandiella, 2020; Mesli et al., 2021; Mouffouk et al., 2021).

SARS-CoV-2 genome contains approximately 30,000 bases but encodes only a few proteins (Dömling & Gao, 2020). The structural proteins, namely, spike protein, envelope protein, membrane protein and nucleocapsid protein are essential to complete the viral structure. Spike (S) protein mediates the entry of virus into host cells (Wrapp et al., 2020); membrane

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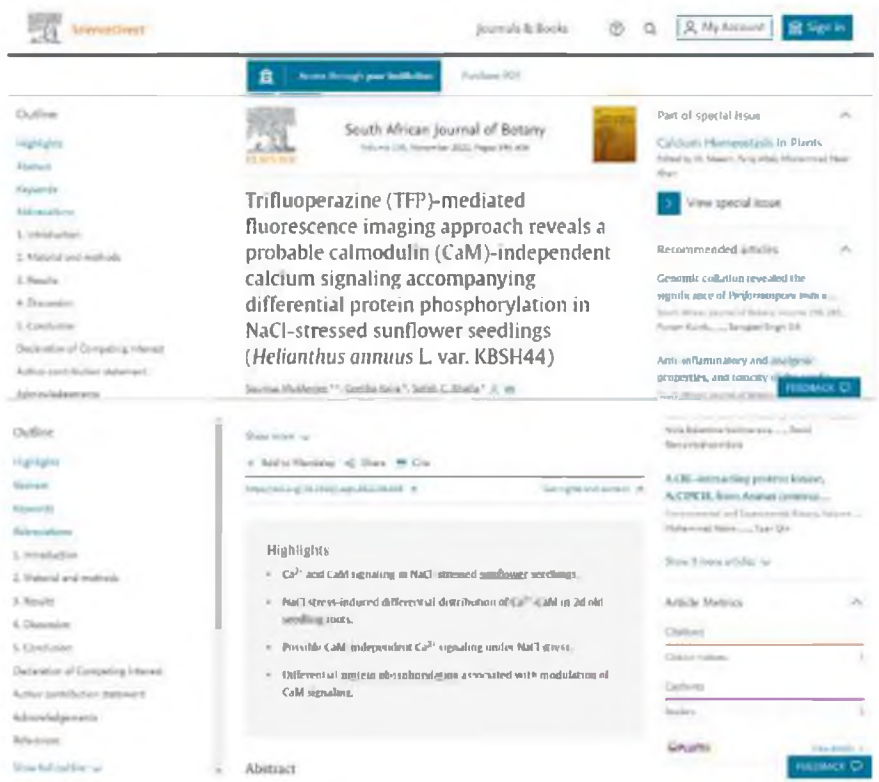
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Breeding System and Response of the Pollinator to Floral Larceny and Florivory Define the Reproductive Success in *Aerides odorata*

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Consumption of pollination reward by felonious means in a plant species can influence the foraging behavior of its pollinator and eventually the reproductive success. So far, studies on this aspect are largely confined to interaction involving plant-pollinators and nectar robbers or thieves. However, a foraging guild in such interactions may also include floral herbivores or florivores. There is a paucity of information on the extent to which nectar larcenists may influence the foraging behavior of the pollinator and reproductive fitness of plants in the presence of a florivore. We investigated various forms of larceny in the natural populations of *Aerides odorata*, a pollinator-dependent and nectar-rewarding orchid. These populations differed in types of foraging guild, the extent of larceny (thieving/robbing), which can occur with or without florivory, and natural fruit-set pattern. The nectariferous spur of the flower serves as an organ of interest among the foraging insects. While florivory marked by excision of nectary dissuades the pollinator, nectar thieving and robbing significantly enhance visits of the pollinator and fruit-set. Experimental pollinations showed that the species is a preferential outbreeder and experiences inbreeding depression from selfing. Reproductive fitness of the orchid species varies significantly with the extent of floral larceny. Although nectar thieving or robbing is beneficial in this self-compatible species, the negative effects of florivory were stronger. Our findings suggest that net reproductive fitness in the affected plant species is determined by the overarching effect of its breeding system on the overall interacting framework of the foraging guild.

Keywords: floral herbivory, foraging guilds, orchids, nectar robbing, mixed-mating

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INTRODUCTION

Floral nectar, the major pollination reward among the flowering plants, is presented to the pollinators in two ways - openly or selectively. The selective mode is associated with flowers in which nectar is concealed. The hidden floral reward can be consumed by a suitable pollinator only when it is legitimately accessed (Fenster, 1991). The dynamics of production and presentation of nectar by a plant play a crucial role in maintaining constancy with suitable pollinators and sustaining fruit-set (fitness). Altered foraging behavior of the pollinator can adversely influence the fitness when there is discontinuous provisioning of rewards. A variety of foragers who illegitimately

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TERM

REVIEW ARTICLE

An Insight of Nanomaterials in Tissue Engineering from Fabrication to Applications

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Tissue engineering is a research domain that deals with the growth of various kinds of tissues with the help of synthetic composites. With the culmination of nanotechnology and bioengineering, tissue engineering has emerged as an exciting domain. Recent literature describes its various applications in biomedical and biological sciences, such as facilitating the growth of tissue and organs, gene delivery, biosensor-based detection, etc. It deals with the development of biomimetics to repair, restore, maintain and amplify or strengthen several biological functions at the level of tissue and organs. Herein, the synthesis of nanocomposites based on polymers, along with their classification as conductive hydrogels and bioscaffolds, is comprehensively discussed. Furthermore, their implementation in numerous tissue engineering and regenerative medicine applications is also described. The limitations of tissue engineering are also discussed here. The present review highlights and summarizes the latest progress in the tissue engineering domain directed at functionalized nanomaterials.

Keywords Tissue engineering · Nanomaterials · Nanotechnology · Regenerative medicine · Biomimetics · Conductive hydrogels · Polymers · Scaffolds

1 Introduction

In tissue engineering (TE) domain, tissue growth is initiated by 3D-scaffolds; the cells proliferate and differentiate into several types or from a base of cells. These scaffolds are combined with growth factors (GFs) to direct cell behaviour and enable the production of tissue. These engineered tissues are functional and capable of implant growth and regeneration [1–5]. Currently, it has become an impressive tool for repairing and reconstructing impaired organs and tissues. In the past two decades, the immense implementation of nanomaterials (NMs) in TE has progressed tremendously (Fig. 1).

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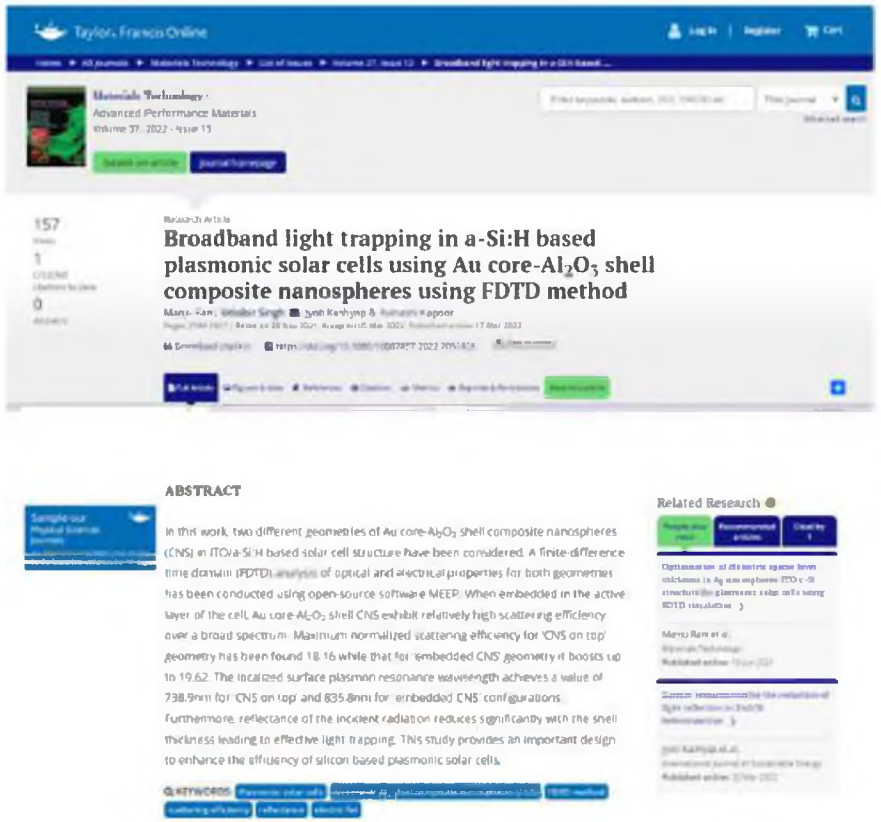
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Materials Technology
Advanced Performance Materials
Broadband light trapping in a-Si:H based plasmonic solar cells using Au core-Al_2O_3 shell composite nanospheres using FDTD method
ABSTRACT
In this work, two different geometries of Au core-Al_2O_3 shell composite nanospheres (CNS) in ITO/a-Si:H based solar cell structure have been considered. A finite-difference time domain (FDTD) analysis of optical and electrical properties for both geometries has been conducted using open-source software MEEP. When embedded in the active layer of the cell, Au core-Al_2O_3 shell CNS exhibit relatively high scattering efficiency over a broad spectrum. Maximum normalized scattering efficiency for 'CNS on top' geometry has been found 18.16 while that for 'embedded CNS' geometry it boosts up to 19.62. The localized surface plasmon resonance wavelength achieves a value of 738.9nm for 'CNS on top' and 835.8nm for 'embedded CNS' configurations. Furthermore, reflectance of the incident radiation reduces significantly with the shell thickness leading to effective light trapping. This study provides an important design to enhance the efficiency of silicon based plasmonic solar cells.
Related Research

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A Novel Framework for Assessing the Criticality of Retrieved Information

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Abstract: Data created by microblogging platforms provide an exceptional opportunity to mine valuable insights; however, their application in critical information retrieval is still at its inflection point. Taking advantage of Deep Learning (DL) and Natural Language Processing (NLP) techniques, this paper proposes a novel framework for retrieving critical information from Twitter to manage emergencies effectively. The proposed framework classifies the tweets into relevant and irrelevant classes using Bidirectional Encoder Representations from Transformers (BERT). Subsequently, relevant tweets are clustered using a k-means algorithm based on textual semantic similarity obtained using Universal Sentence Encoder (USE). Finally, the critical value of tweets is computed to segregate the relevant information that may assist the management teams to plan and organize their operations efficiently. The proposed work was tested on a real-world dataset of Uttarakhand Floods that occurred in February 2021. The critical information retrieved may be deployed to quickly manage disastrous situations and take the appropriate measures in time.

Keywords: Text Classification, BERT, k-means, Semantic Similarity, Clustering, Information Retrieval, Critical information.

1. Introduction

The advent of social media has marked a shift in information collection and dissemination during emergencies [1]. Researchers have leveraged social media to conduct numerous studies, including but not limited to outbreak detection [2], [3], information retrieval [4], evacuation behavior [5], [6], hazard assessment [6], and damage assessment [7], [8]. Twitter is one of the microblogging platforms that facilitate researchers in carrying out their studies on real-world data. It has 316 million users [9], empowering it with the capability of real-time feedback. Therefore, the potential of Twitter as a dependable and relevant data source is evident [10], [11]. It provides a platform for sharing crucial information and opinions on news updates, government and non-government initiatives and policies, and even requesting assistance during critical times [3], [12], [13]. Many studies [14], [15], [16], [17], [18] have proved that social media platforms like Twitter have also been beneficial to spread situational awareness during an emergency. Situational awareness may be defined as the available knowledge to assess and cope with a situation [18]. Thus, it plays an essential role in helping people during an emergency.

During critical times, government and non-government organizations look for related information to mitigate the adverse impact of the tragedies. Public authorities rely on timely and vital information to launch their operations timely for rescue management. The concerned authorities may send out alerts and learn the urgent needs of affected people to allocate the resources and take appropriate actions [8], [19]. Although social media platforms are promising data resources for emergencies, identifying helpful information for decision-making and action-taking is still challenging [20].

The vast volume of data on social media may contain an enormous amount of unwanted information, which can be overwhelming and bewildering to anyone trying to retrieve crucial details [21], [22]. Thus, it is essential to filter out the irrelevant information and segregate the relevant information to ensure that the precise information reaches the concerned authorities in time. Further, it may reduce the response time for relief and recovery measures during the emergency and increase situational awareness. As natural disasters are occurring more frequently than ever before, a system that could collect the data quickly during the crisis and facilitate assessing the severity of the situation

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Multiple ionisation and Coulomb explosion following photoexcitation of xenon clusters has been studied at ~10^{12} W/cm^2 at three different wavelengths in UV and visible region. Multiply charged xenon ions (Xe^{q+}) up to +4, +6 and +10 states were observed in time of flight mass spectra at 266, 355 and 532 nm respectively. Energetic electrons were also detected and electron energy distribution was measured at all the three wavelengths. The maximum electron energy was found to be dependent on the ionising wavelength. It has been established that multiphoton ionisation creates Xe^+ ions and the energetic electrons cause secondary ionization of singly charged xenon ion (Xe^+) to give rise to higher charged states of xenon. An analytical model has been developed to understand the multiple ionization of xenon clusters at terawatt laser intensity. It reveals that lowering of ionization potential and excitation to Rydberg states of ions are important factors to generate high charge states like Xe^{10+}, comparison are with the experimental results.

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Short Communication

Genome-based reclassification of *Amycolatopsis eurytherma* as a later heterotypic synonym of *Amycolatopsis thermoflava*

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REVIEW
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Endophytic Nanotechnology: An Approach to Study Scope and Potential Applications

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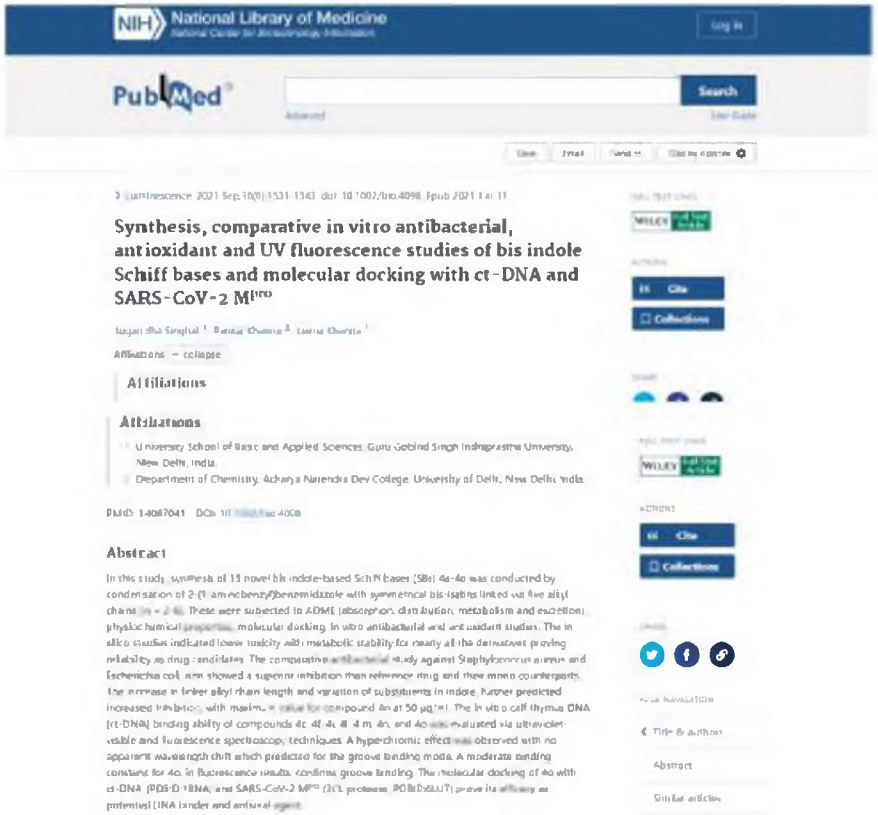
Nanotechnology has become a very advanced and popular form of technology with huge potentials. Nanotechnology has been very well explored in the fields of electronics, automobiles, construction, medicine, and cosmetics, but the exploration of nanotechnology's use in agriculture is still limited. Due to climate change, each year around 40% of crops face abiotic and biotic stress; with the global demand for food increasing, nanotechnology is seen as the best method to mitigate challenges in disease management in crops by reducing the use of chemical inputs such as herbicides, pesticides, and fungicides. The use of these toxic chemicals is potentially harmful to humans and the environment. Therefore, using NPs as fungicides/ bacteriocides or as nanofertilizers, due to their small size and high surface area with high reactivity, reduces the problems in plant disease management. There are several methods that have been used to synthesize NPs, such as physical and chemical methods. Specially, we need ecofriendly and nontoxic methods for the synthesis of NPs. Some biological organisms like plants, algae, yeast, bacteria, actinomycetes, and fungi have emerged as superlative candidates for the biological synthesis of NPs (also considered as green synthesis). Among these biological methods, endophytic microorganisms have been widely used to synthesize NPs with low metallic ions, which opens a new possibility on the edge of biological nanotechnology. In this review, we will have discussed the different methods of synthesis of NPs, such as top-down, bottom-up, and green synthesis (specially including endophytic microorganisms) methods, their mechanisms, different forms of NPs, such as magnesium oxide nanoparticles (MgO-NPs), copper nanoparticles (Cu-NPs), chitosan nanoparticles (CS-NPs), β-d-glucan nanoparticles (GNPs), and engineered nanoparticles (quantum dots, metalloids, nonmetals, carbon nanomaterials, dendrimers, and liposomes), and their molecular approaches in various aspects. At the molecular level, nanoparticles, such as mesoporous silica nanoparticles (MSN) and RNA-interference molecules, can also be used as molecular tools to carry genetic material during genetic engineering of plants. In plant disease management, NPs can be used as biosensors to diagnose the disease.

Keywords: nanotechnology, nanoparticles, crop yield, genetic engineering, molecular approaches, gene carriers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Synthesis, comparative in vitro antibacterial, antioxidant and UV fluorescence studies of bis indole Schiff bases and molecular docking with ct-DNA and SARS-CoV-2 Mpro
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Abstract

Coronaviruses, 2021, 2, e300421188050

REVIEW ARTICLE

Structure, Transmission, Diagnostic Symptoms, Host and Entry Mechanism of COVID-19: A Review

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Abstract: In Wuhan, China, a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been reported and caused coronavirus disease 19 (COVID-19). The coronavirus infection is pathogenic and highly transmittable and spread quickly around the world by the human to human contact. Through genomic analysis, it has been revealed that the primary reservoir of SARS-CoV-2 is bats due to having severe acute respiratory syndrome-like (SARS-like) viruses phylogenetically. The viral infection is rapidly transmitted by the human to human contact, but the intermediate source of their origin and transfer is not known. To date, any clinically approved vaccine or antiviral drug has not been prepared against COVID-19. However, researchers and scientists have evaluated some broad-spectrum antiviral drugs against COVID-19 through clinical trials and they have found satisfactory clinical recovery. This review summarizes the comparative analysis of the emergence and pathogenicity of COVID-19, severe acute respiratory syndrome coronavirus (SARS-CoV), and Middle East respiratory syndrome coronavirus (MERS-CoV). This review is also focused on the development of effective vaccines or antidrug and also provides details related to an approach to practice therapeutic combinations to fight against this viral outbreak.

Keywords: COVID-19, SARS-CoV-2, glycoprotein, infection, symptoms, prevention.

1. INTRODUCTION

The term corona has been raised from the crown-like appearance (Corona is a Latin word it means crown-like). Nucleic acid material of coronavirus constituted with single-stranded RNA. The virus is also known as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), and the family of coronavirus is divided into different classes such as alpha (α), beta (β), gamma (γ), and delta (δ). The β class of coronavirus was reported as the main cause of COVID-19. This disease has been declared as a pandemic and zoonotic disease due to quick transmission in animals and humans. Previously, it is known that this virus is only transmitted in animals until the world witnessed in humans. In Guangdong, China 2003, SARS-CoV has been identified as the outbreak of SARS-CoV-1 [1]. In Middle Eastern countries, an endemic was announced due to another pathogenic coronavirus, called the Middle East respiratory syndrome (MERS-CoV), only a decade later [2]. Recently, Wuhan emerged as the business hub of china at the end of 2019. An outbreak of a novel coronavirus reported more than 177000 deaths and over sixteen lakhs of infections. Previously, SARS-CoV-2 has been named as the Wuhan coronavirus or 2019 novel coronavirus (2019-NCOV) in China, which further finally named as SARS-CoV-2 by the International Committee on Taxonomy of Viruses (ICTV) and this disease called COVID-19 [3-5]. In 2003, SARS-CoV infected around 8098 individuals with 9% mortality rate across 26 countries globally, while novel coronavirus 2019 caused infection and death around 4098018 and 283271 in individuals with a 2.9% mortality rate across 215 countries.

2. NOMENCLATURE

According to the World Health Organisation (WHO), U.S. Centers for Disease Control and Prevention (CDC), and ICTV, COVID-19 stands for CO-corona, VI-virus, D-disease, 19-2019 while SARS-CoV-2 for severe acute respiratory syndrome coronavirus-2 [6].

3. CLASSIFICATION

According to ICTV [1, 7], the classification of coronavirus is given below.

Category	Coronaviruses
Realm	*Riboviria*

contd....

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Computational identification and characterization of antigenic properties of Rv3899c of *Mycobacterium tuberculosis* and its interaction with Human leukocyte antigen (HLA)

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REVIEW ARTICLE

Taxonomically Characterized and Validated Bacterial Species Based on 16S rRNA Gene Sequences from India During the Last Decade

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Abstract Microbial taxonomy dealing with identification and characterization of prokaryotes like bacteria and archaea has always been a major area of research all over the world. Exploring diversity of microbes and description of novel species with different genes and secondary compounds is of utmost importance for better future and sustenance of life. India having an enormous range of ecosystems and diverse species inhabiting these niches is considered to be one of the richest biodiversity regions of the world. During the last decade, with newer methodologies and better technology, the prokaryotic taxonomy from India has extended our inventory of microbial communities in specific niches. However, there still exist some limitations in classifying the microbes from India as compared to that is done world-over. This review enlists the taxonomic description of novel taxa of prokaryotes from India in the past decade. A total of 378 new bacterial species have been classified from different habitats in India in the last ten years and no descriptions of archaeal species is documented till date.

Keywords Microbial taxonomy · Classification · Niches · Novel species · Indian biodiversity

Princy Hira and Priya Singh have contributed equally to this work.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12088-019-00845-7) contains supplementary material, which is available to authorized users.

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Introduction

Among one of the richest biodiversity regions of the world, India encompasses from greater Himalayas in the north to the second largest peninsula in the south that show diverse environmental conditions across it and contain three unique biodiversity hotspots viz., Western Ghats, eastern Himalayas and the Indo-Burma region. Also, it has desert in west, world's largest alluvial plain (Great plain of north India) and the thick forests in east. This results into richness of the diversity of both flora and fauna with respect to various environmental conditions. While the wealth of this diversity with respect to higher forms of life, viz., plants and animals is well explored and inventoried, such efforts in prokaryote diversity are recent that need lot more to be discovered and classified. The field of microbial taxonomy in India has taken a new dimension in the last decade and exponentially added the descriptions of new taxa of prokaryotes in the catalogue using polyphasic approach. Along with the description of novel species, the identification of new genes important for environment and human health has various industrial and biotechnological applications [1]. Therefore, taxonomical classification of commercially important organisms acts as a base for further studies on microbiological research. While there are quite a few research groups carrying out microbial taxonomy in India, but with the new and improved methodologies in the recent years' microbiologists have managed to unravel the

ORIGINAL RESEARCH ARTICLE

Prediction of Transcription Factors and Their Involvement in Regulating Rifamycin Production in *Amycolatopsis mediterranei* S699

Nirjara Singhvi[1] · Vipin Gupta[1] · Priya Singh[1,2] · Om Prakash[3] · Andreas Bechthold[4] · Yogendra Singh[1] · Rup Lal[5]

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Abstract *Amycolatopsis mediterranei* S699 produces rifamycin B and successors of this strain are in use for the industrial production of rifamycin B. Semisynthetic derivatives of rifamycin B are used against *Mycobacterium tuberculosis* that causes tuberculosis. Although the rifamycin biosynthetic gene cluster was characterized two decades ago, the regulation of rifamycin B biosynthesis in *Amycolatopsis mediterranei* S699 is poorly understood. In this study, we analysed the genome and proteome of *Amycolatopsis mediterranei* S699 and identified 1102 transcription factors which comprise about 10% of the total genome. Using interactomics approaches we delineated 30 unique transcription factors directly involved in secondary metabolism that regulate rifamycin B biosynthesis. We also predict the role of RifN as hub in controlling the regulation of other genes involved in rifamycin biosynthesis. RifN is important for maintaining the integrity of the rifamycin-network. Thus, these transcription factor can be exploited to improve rifamycin B production in *Amycolatopsis mediterranei* S699.

Keywords Transcription factors · *Amycolatopsis mediterranei* · Rifamycin · Regulation · Interactomics

Nirjara Singhvi and Vipin Gupta have contributed equally.

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Introduction

In prokaryotic cells, transcription factors (TF) are proteins that play important role in controlling the rate of transcription of a gene. TF's bind to specific DNA sequences enabling RNA-polymerases to perform the transcription process. There are a wide range of transcription factors. Some harbour DNA binding regions that bind directly to promotors. Others bind to the enhancer region of a gene. Proteins binding directly to the promoter region initiates the transcription process. TFs binding to the enhancer regions are indirectly stimulating or repressing the transcription process [1]. It is known that regulation of transcription factor is the most important form to control a gene expression. TF have been identified in bacterial family actinobacteria like genus *Streptomyces* have been reported to control gene expression and their regulation within the organized network [1, 2].

Amycolatopsis mediterranei S699 is a well-known actinobacterium that produces rifamycin B. It has been developed as industrial strains for the production of rifamycin B primarily by using classical strain improvement methods [3]. Semisynthetic derivatives of rifamycin B are

Review

Epub 2020 Aug 19

PGPR-mediated induction of systemic resistance and physiochemical alterations in plants against the pathogens: Current perspectives

Mukesh Meena [1,3], Prashant Swapnil [2,3], Kumari Divyanshu [1], Sunil Kumar [2], Harish [4], Yashoda Nandan Tripathi [3], Andleeb Zehra [3], Avinash Marwal [1], Aam Sanmukh Upadhyay [2]

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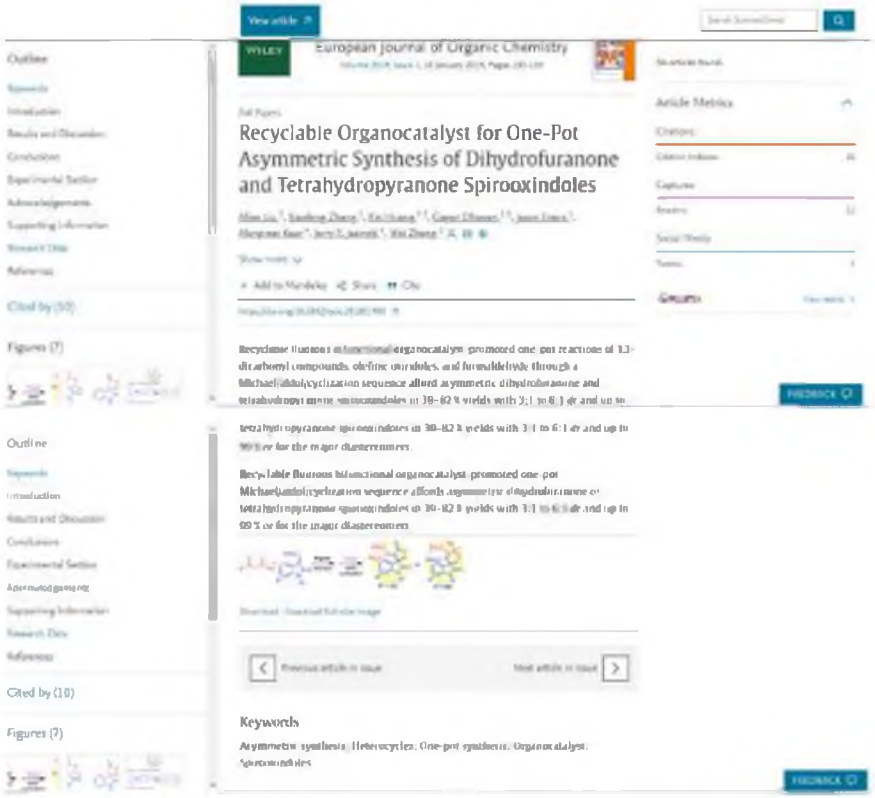
Abstract

Plant growth-promoting rhizobacteria (PGPR) are diverse groups of plant-associated microorganisms, which can reduce the severity or incidence of disease during antagonism among bacteria and soil-borne pathogens, as well as by influencing a systemic resistance to elicit defense response in host plants. An amalgamation of various strains of PGPR has improved the efficacy by enhancing the systemic resistance opposed to various pathogens affecting the crop. Many PGPR used with seed treatment causes structural improvement of the cell wall and physiological/biochemical changes leading to the synthesis of proteins, peptides, and chemicals occupied in plant defense mechanisms. The major determinants of PGPR-mediated induced systemic resistance (ISR) are lipopolysaccharides, lipopeptides, siderophores, pyocyanin, antibiotics 2,4-diacetylphoroglucinol, the volatile 2,3-butanediol, N-alkylated benzylamine, and iron-regulated compounds. Many PGPR inoculants have been commercialized and these inoculants consequently aid in the improvement of crop growth yield and provide effective reinforcement to the crop from disease, whereas other inoculants are used as biofertilizers for native as well as crops growing at diverse extreme habitat and exhibit multifunctional plant growth-promoting attributes. A number of applications of PGPR formulation are needed to maintain the resistance levels in crop plants. Several microarray-based studies have been done to identify the genes, which are associated with PGPR-induced systemic resistance. Identification of these genes associated with ISR-mediating disease suppression and biochemical changes in the crop plant is one of the essential steps in understanding the disease resistance mechanisms in crops.


European Journal of Organic Chemistry
Recyclable Organocatalyst for One-Pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone Spirooxindoles
Keywords

A modified intuitionistic fuzzy c-means clustering approach to segment human brain MRI image

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Abstract

Fuzzy c means (FCM) is one of the prominent method utilized for medical image segmentation. The research work [1] suggested intuitionistic fuzzy c-means to handle uncertainty and vagueness associated with real data. The author defined an objective function which incorporated the hesitation degree along with membership degree. However, instead of solving the objective function analytically, the approximate solution is obtained. In this paper, we have proposed a modified intuitionistic fuzzy c-means algorithm (MIFCM) and solved analytically the objective function of modified intuitionistic fuzzy c means algorithm (MIFCM) using Lagrange method of undetermined multiplier. To incorporate hesitation degree, two parametric intuitionistic fuzzy complements namely Sugeno's negation function and Yager's negation function are investigated. The performance of the proposed MIFCM method is compared with three intuitionistic fuzzy clustering methods and the FCM on two publically available MRI dataset and a synthetic dataset. The performance measures (average segmentation accuracy, dice score, jaccard score, false negative ratio and false positive ratio) are used to compare the performance of the proposed method with three variants of intuitionistic fuzzy clustering methods and the FCM. Experimental results demonstrate the superior performance of the proposed method over others.

1 Introduction

Image segmentation is one of the important phase in image analysis and pattern recognition because of its wide real life applications such as medical image analysis, computer vision, industrial inspections etc.. In last few years, medical image analysis is used for diagnosis of various disease such as Parkinson, Alzheimer, Schizophrenia etc.. For this, many medical imaging modalities, such as Computed

Advances in Natural Sciences: Nanoscience and Nanotechnology

PAPER

Performance of chitosan derived activated carbon in supercapacitor

Sultan Ahmed[1,2], Ahsan Ahmed[3] and M Rafat[1]

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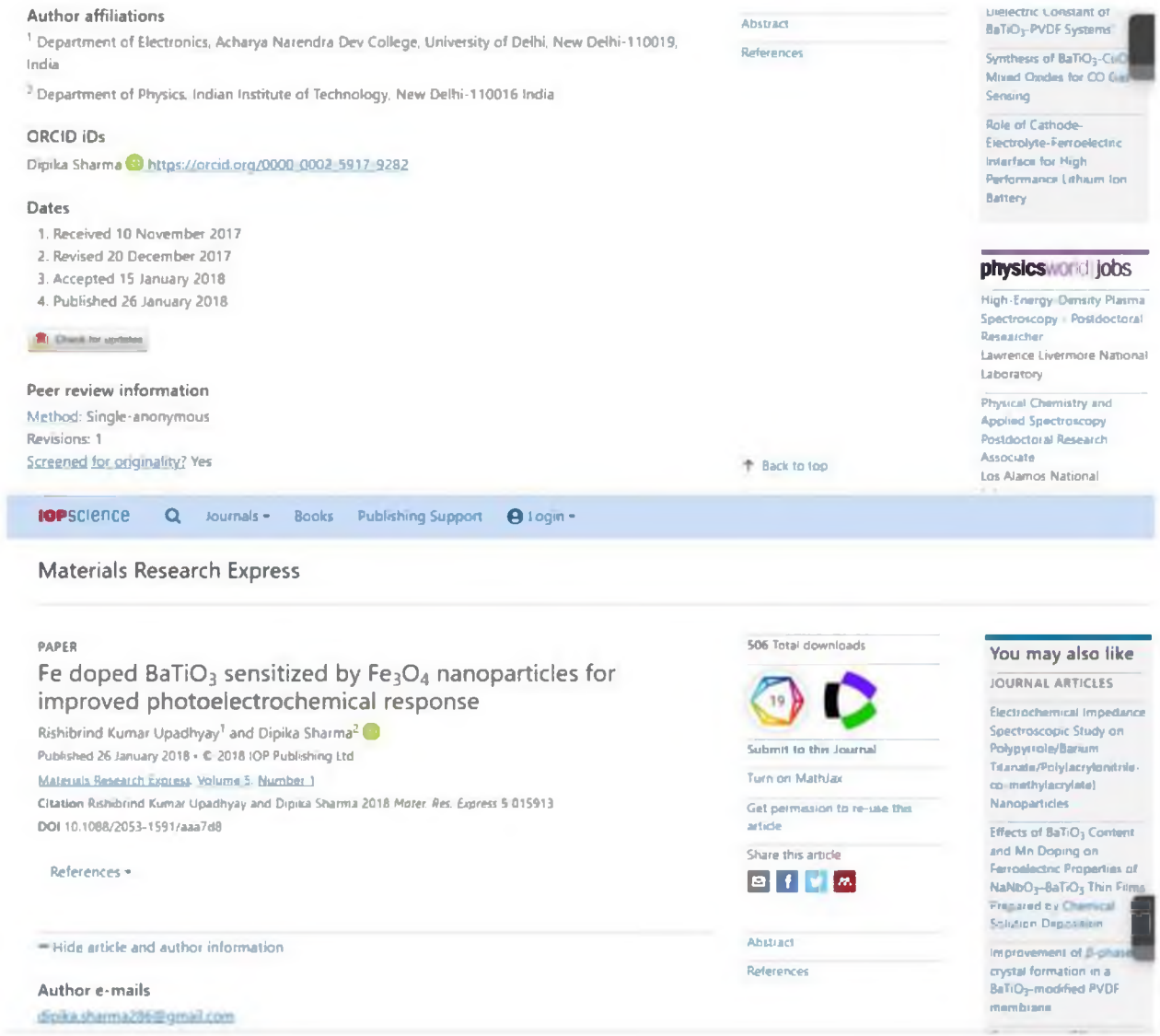

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Fe doped $BaTiO_3$ sensitized by Fe_3O_4 nanoparticles for improved photoelectrochemical response

Rishibrind Kumar Upadhyay[1] and Dipika Sharma[2]

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DASC: data aware algorithm for scalable clustering

Vasudha Bhatnagar, Sharanjit Kaur, Rakhi Saxena & Dhriti Khanna

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Abstract

Abstract

Emergence of MapReduce (MR) framework for scaling data mining and machine learning algorithms provides for *Volume*, while handling of *Variety* and *Velocity* needs to be skilfully crafted in algorithms. So far, scalable clustering algorithms have focused solely on *Volume*, taking advantage of the MR framework. In this paper we present a MapReduce algorithm—data aware scalable clustering (DASC), which is capable of handling the 3 Vs of *big data* by virtue of being (i) single scan and distributed to handle *Volume*, (ii) incremental to cope with *Velocity* and (iii) versatile in handling numeric and categorical data to accommodate *Variety*. DASC algorithm incrementally processes infinitely growing data set stored on distributed file system and delivers quality clustering scheme while ensuring recency of patterns. The up-to-date synopsis is preserved by the algorithm for the data seen so far. Each new data increment is processed and merged with the synopsis. Since the synopsis itself may grow very large in size, the algorithm stores it as a file. This makes DASC algorithm truly scalable. Exclusive clusters are obtained on demand by applying connected component analysis (CCA) algorithm over the synopsis. CCA presents subtle roadblock to effective parallelism during clustering. This problem is overcome by accomplishing the task in two stages. In the first stage, *hyperclusters* are identified based on prevailing data characteristics. The second stage utilizes this knowledge to determine the degree of parallelism, thereby making DASC data aware. *Hyperclusters* are distributed over the available compute nodes for discovering embedded

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Bioacoustics or pitfall traps: comparison of a modern and traditional method to estimate Ensifera richness

JOURNAL ARTICLE

Bioacoustics or pitfall traps: comparison of a modern and traditional method to estimate Ensifera richness

Manisha Tomar, Abhay Pratap Singh and Swati Diwakar

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SUPPORTING DOCUMENT FOR 3.3.1.1

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3.3.1 Number of papers published per teacher in the Journals notified on UGC website during the last five years (5)

S. No	Title of paper	Name of the author/s	Department of	Name of journal	Year of publication	ISSN number	Link to the recognition	Link to paper/ abstract of	Provide the link to Journal website	Indicate Journal's indexing in
	a	b	c	d	e	f	g	h	i	j
1	**One-pot and catalyst-free synthesis of pyrroloquinolinediones and quinolinedicarboxylates**	Zhang, X., **Dhawan, G.**, Muthengi, A., Liu, S., Wang, W., Legris, M., &	Biomedical Science	Green Chemistry	2017	1463-9262	https://doi.org/10.1039/C7GC01380A	https://pubs.rsc.org/en/content/articlelanding/2017/GC/C7GC01380A	https://mjl.clarivate.com:/search-results?issn=1463-9262&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
2	**A robust replenishment model for deteriorating items considering ramp-type demand and inflation under fuzzy environment**	Sharma, A., Sharma, U., & **Singh, C.**	Mathematics	International Journal of Logistics Systems and	2017	1.7E+07	https://doi.org/10.1504/IJLSM.2017.086944	https://www.inderscienceonline.com/doi/abs/10.1504/IJLSM.2017.086944	https://www.scopus.com/sourceid/4700151504	Indexed in UGC Care List and SCOPUS
3	**Supply chain model with two storage facility for stock dependent demand incorporating learning and inflationary effect under**	**Singh, C.**, & Singh, S. R.	Mathematics	International Journal of Fuzzy System Applications	2017	2156-177X	10.4018/IJFSA.2017040105	https://www.igi-global.com/gateway/article/179322#pnlRecommendationForm	https://www.scopus.com/sourceid/21100301444	Indexed in UGC Care List and SCOPUS
4	**Inhibition of gut proteases and development of dengue vector, Aedes aegypti by Allium sativum protease inhibitor**	Shamsi, T. N., Parveen, R., Ahmad, A., Samal, R. R., **Kumar, S.**, &	Zoology	Acta Ecologica Sinica	2017	1872-2032	https://doi.org/10.1016/j.chnaes.2018.01.002	https://www.sciencedirect.com/science/article/abs/pii/S1872203217301695	https://mjl.clarivate.com/search-results?issn=1000-0933&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
5	**Assessment of Achyranthes aspera induced toxicity and molecular analysis of RAPD-PCR profiles of larval genomic DNA of Aedes**	**Sharma, A.**, Kumar, S., & Tripathi, P.	Zoology	Journal of Parasitic Diseases	2017	0971-7196	https://doi.org/10.1007/s12639-017-0935-1	https://link.springer.com/article/10.1007/s12639-017-0935-1	https://mjl.clarivate.com:/search-results?issn=0971-7196&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
6	**Assessment of Achyranthes aspera induced toxicity and molecular analysis of RAPD-PCR profiles of larval genomic DNA of Aedes**	Sharma, A., **Kumar, S.**, & Tripathi, P.	Zoology	Journal of Parasitic Diseases	2017	0971-7196	https://doi.org/10.1007/s12639-017-0935-1	https://link.springer.com/article/10.1007/s12639-017-0935-1	https://mjl.clarivate.com:/search-results?issn=0971-7196&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
7	**A facile and rapid method for green synthesis of Achyranthes aspera stem extract-mediated silver nanocomposites with cidal**	Sharma, A., **Kumar, S.**, & Tripathi, P	Zoology	Saudi Journal of Biological Sciences	2017	1319-562X	https://doi.org/10.1016/j.sjbs.2017.11.001	https://www.sciencedirect.com/science/article/pii/S1319562X17302759	https://mjl.clarivate.com:/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

8	**A facile and rapid method for green synthesis of Achyranthes aspera stem extract-mediated silver nanocomposites with cidal**	**Sharma, A.**, Kumar, S., & Tripathi, P	Zoology	Saudi Journal of Biological Sciences	2017	1319-562X	https://doi.org/10.1016/j.sjbs.2017.11.001	https://www.sciencedirect.com/science/article/pii/S1319562X17302759	https://mjl.clarivate.com:/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
9	**Taxonomic and morphogenetic description of the freshwater ciliate Aponotohymena isoaustralis n. sp. (Ciliophora;**	Gupta, R., Abraham, J. S., Sripoorna, S., **Toteja, R.**, Makhija, S., & El-	Zoology	Acta Protozoologica	2017	0065-1583	10.4467/16890027AP.17.008.7483	https://www.proquest.com/openview/14a339a68fe019b3b23e8a868614850f/1?pq-	https://mjl.clarivate.com:/search-results?issn=0065-1583&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
10	**Taxonomic and morphogenetic description of the freshwater ciliate Aponotohymena isoaustralis n. sp. (Ciliophora;**	Gupta, R., Abraham, J. S., Sripoorna, S., Toteja, R., **Makhija, S.**, & El-	Zoology	Acta Protozoologica	2017	0065-1583	10.4467/16890027AP.17.008.7483	https://www.proquest.com/openview/14a339a68fe019b3b23e8a868614850f/1?pq-	https://mjl.clarivate.com:/search-results?issn=0065-1583&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
11	**Taxonomic and morphogenetic description of the freshwater ciliate Aponotohymena isoaustralis n. sp. (Ciliophora;**	Gupta, R., Abraham, J**. S., Sripoorna, S.**, Toteja, R., Makhija, S., & El-	Zoology	Acta Protozoologica	2017	0065-1583	10.4467/16890027AP.17.008.7483	https://www.proquest.com/openview/14a339a68fe019b3b23e8a868614850f/1?pq-	https://mjl.clarivate.com:/search-results?issn=0065-1583&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
12	**Taxonomic and morphogenetic description of the freshwater ciliate Aponotohymena isoaustralis n. sp. (Ciliophora;**	Gupta, R., **Abraham, J**. S., Sripoorna, S., Toteja, R., Makhija, S., & El-	Zoology	Acta Protozoologica	2017	0065-1583	10.4467/16890027AP.17.008.7483	https://www.proquest.com/openview/14a339a68fe019b3b23e8a868614850f/1?pq-	https://mjl.clarivate.com:/search-results?issn=0065-1583&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
13	**Diversity and abundance of ammonia-oxidizing bacteria and archaea in a freshwater recirculating aquaculture system**	**Khangembam, C. D.**, Sharma, J. G., & Chakrabarti, R.	Zoology	Hayati Journal of Biosciences,	2017	2053-9711	https://doi.org/10.1016/j.hjb.2017.11.003	https://www.sciencedirect.com/science/article/pii/S1978301917301596	https://mjl.clarivate.com:/search-results?issn=2053-9711&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
14	**Beyond the "Code": a guide to the description and documentation of biodiversity in ciliated protists (Alveolata, Ciliophora)**	Warren, A., Patterson, D. J., Dunthorn, M., Clamp, J. C., Achilles-Day, U. E. M., Aescht, E., Al-Farraj, S. A.,	Zoology	Journal of eukaryotic Microbiology,	2017	1066-5234	https://doi.org/10.1111/jeu.12391	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12391	https://mjl.clarivate.com:/search-results?issn=1066-5234&hide_exact_match_fl=true&utm_source=mjl&utm_medium=share-by-	Indexed in UGC Care List, SCOPUS and Web of Science
15	**Assessment of heavy metal toxicity in four species of freshwater ciliates (Spirotrichea; Ciliophora) from Delhi, India**	Abraham, J. S., Sripoorna, S., **Choudhary, A.**, Toteja, R., Gupta, R.,	Zoology	Current Science	2017	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/113/11/2141.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

16	**Assessment of heavy metal toxicity in four species of freshwater ciliates (Spirotrichea; Ciliophora) from Delhi, India**	Abraham, J. S., **Sripoorna, S.**, Choudhary, A., Toteja, R., Gupta, R.,	Zoology	Current Science	2017	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/113/11/2141.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
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19	**Assessment of heavy metal toxicity in four species of freshwater ciliates (Spirotrichea; Ciliophora) from Delhi, India**	**Abraham, J.** S., Sripoorna, S., Choudhary, A., Toteja, R., Gupta, R.,	Zoology	Current Science	2017	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/113/11/2141.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
20	**Influence of copper and cadmium toxicity on the activity of an antioxidant enzyme, superoxide dismutase in freshwater**	**Toteja, R.**, Makhija, S., Sripoorna, S., Abraham, J. S. & Gupta, R	Zoology	Indian Journal of Experimental Biology	2017	0019-5189	https://nopr.niscpr.res.in/handle/123456789/42844 /	http://nopr.niscpr.res.in/bitstream/123456789/42844/1/IJEB%2055%2810%29%206	https://mjl.clarivate.com:/search-results?issn=0019-5189&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
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22	**Influence of copper and cadmium toxicity on the activity of an antioxidant enzyme, superoxide dismutase in freshwater**	Toteja, R., **Makhija, S.**, Sripoorna, S., Abraham, J. S. & Gupta, R	Zoology	Indian Journal of Experimental Biology	2017	0019-5189	https://nopr.niscpr.res.in/handle/123456789/42844 /	http://nopr.niscpr.res.in/bitstream/123456789/42844/1/IJEB%2055%2810%29%206	https://mjl.clarivate.com:/search-results?issn=0019-5189&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
23	**Influence of copper and cadmium toxicity on the activity of an antioxidant enzyme, superoxide dismutase in freshwater**	Toteja, R., Makhija, S., **Sripoorna, S.**, Abraham, J. S. & Gupta, R	Zoology	Indian Journal of Experimental Biology	2017	0019-5189	https://nopr.niscpr.res.in/handle/123456789/42844 /	http://nopr.niscpr.res.in/bitstream/123456789/42844/1/IJEB%2055%2810%29%206	https://mjl.clarivate.com:/search-results?issn=0019-5189&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science

24	**Assessment of Particulate Matter (PM)concentrations at a typical construction site in Bangalore, India.**	**Chowdhuri A** and Gupta C K	Physics and Botany	International Research Journal of Environmen	2017	ISSN : 2319 - 1414	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-177.php	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-177.php	**PEER REVIEWED**
25	**Assessment of Particulate Matter (PM)concentrations at a typical construction site in Bangalore, India.**	Chowdhuri A and **Gupta C K**	Physics and Botany	International Research Journal of Environmen	2017		https://doi.org/10.1016/j.snb.2016.07.040	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-177.php	http://www.isca.in/IJENS/Archive/v6/i2/3.ISCA-IRJEvS-2016-177.php	**PEER REVIEWED**
26	**Distinct detection of liquor ammonia by ZnO/SAW sensor: study of complete sensing mechanism.**	**Raj V B,** Singh H, Nimal A T, Sharma MU, Tomar M and Gupta V	Physics	Sensors and Actuators B	2017	ISSN: 0020-0255	https://doi.org/10.1016/j.snb.2016.07.040	https://www.sciencedirect.com/science/article/pii/S0925400516310759	https://www.sciencedirect.com/science/article/pii/S0925400516310759	**SCOPUS INDEXED**
27	**Sensitivity Enhancement Studies of SAW vapor sensor by oscillator tuning using Varactor diode**	Singh H, Parmar Y, **Raj V B,** Pandya H M, Kumar J, Mishra M, Nimal A T	Physics	IEEE Sensors	2017	ISSN:1530-437X	DOI: 10.1109/JSEN.2016.2647282	https://ieeexplore.ieee.org/document/7803545	https://ieeexplore.ieee.org/document/7803545/authors#authors	**SCOPUS INDEXED**
28	**Alterations in the reactive oxygen species in peripheral blood of chronic myeloid leukemia patients from Northern India**	**Jetly, S.,** Verma, N., Naidu, K., Faiq, M. A., Tulika, S., & Saluja, D.	Biomedical Science	Journal of clinical and diagnostic research	2017		doi: 10.7860/JCDR/2017/28565.10425	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5620896/	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5620896/	**SCOPUS INDEXED**
29	**An analysis upon various strategies for redesign and direct evolution of enzyme engineering**	Sharma, S. V., & **Hooda, S.**	Chemistry	Journal of Advances in Science and Technology	2017	2230-9659	http://ignited.in/p/55520	http://ignited.in/p/55520	- http://ignited.in/p/55520	**PEER REVIEWED**
30	**Comparative study of removal of Cu and Pb from aqueous solution by using modified rice husk ask as an adsorbent**	Kumar, R., **Arya, D. K.,** Singh, N., & Vats, H. K.	Chemistry	International Journal of Chemistry and Applications	2017	2278-8719	https://www.researchgate.net/publication/334446847_Com	https://www.researchgate.net/publication/334446847_Comparative_study_of_Removal_	- https://www.researchgate.net/publication/334446847_Comparative_study_of_Removal_	**PEER REVIEWED**

31	**Developing a low cost activated carbon from agricultural waste for the removal of heavy metal from cotaminated waste**	Kumar, R., **Arya, D. K.,** Singh, N., & Vats, H. K.	Chemistry	Internation al Journal of Applied Chemistry	2017	0973-1792	**https://www.ripublication.com/ijac17/ijacv13n3_06.pdf**	**https://www.ripublication.com/ijac17/ijacv13n3_06.pdf**	https://www.ripublication.com/ijac17/ijacv13n3_06.pdf	**PEER REVIEWED**
32	**Sportsmen's energy package Cordyceps sinensis: Medicinal importance and responsible phytochemical constituents**	Joshi, Y. C., Joshi, M. C., Chopra, V., Joshi, R. K., Sharma, R. Kant., & **Kumar, V**.	Chemistry	American Journal of Essential Oils and Natural	2017	2321-9114	**https://www.essencejournal.com/archives/2017/5/2/A/5-2-**	**https://www.essencejournal.com/archives/2017/5/2/A/5-2-2**	https://www.essencejournal.com/archives/2017/5/2/A/5-2-2	**PEER REVIEWED**
33	**Online signature verification: A review**	Chaudhary, U., **Samal, C. K.,** & Kumar, V.	Computer Science	IOSR Journal of Computer Engineering	2017	2278-8727	UGC Journal No. 4899	https://www.researchgate.net/publication/303805873_Online_Signature_Verificatio	https://www.researchgate.net/publication/303805873_Online_Signature_Verification_A_Review	**PEER REVIEWED**
34	**Comparative analysis on path planning algorithm's on mobile robot in image processing**	Choudhury, R. K., & **Samal, C. K.**	Computer Science	Journal of Advance Engineering and Research	2017	2348-4470	https://issuu.com/editorijaerd/docs/comparative_analysis_on	https://issuu.com/editorijaerd/docs/comparative_analysis_on_path_planni	https://issuu.com/editorijaerd/docs/comparative_analysis_on_path_planni	**PEER REVIEWED**
35	**Impact of DDA optimization on mobile robot path planning for mixed image in image processing**	Choudhury, R. K., & **Samal, C. K.**	Computer Science	Internation al Journal of Advanced Research in Computer	2017	0976-5697	https://doi.org/10.26483/ijarcs.v8i8.4624	http://ijarcs.info/i	http://ijarcs.info/index.php/Ijarcs/article/view/4624	**PEER REVIEWED**
36	**Target assignment in robotics and its distance optimality using DDA optimization in image processing**	Choudhury, R. K., & **Samal, C. K.**	Computer Science	Internation al Journal of Science and Research Methodolo	2017	2454-2008	https://ijsrm.humanjournals.com/wp-content/upl	https://ijsrm.humanjournals.com/wp-content/uploads/2017/10/4.Rama-	https://ijsrm.humanjournals.com/wp-content/uploads/2017/10/4.Rama-Kanta-Choudhury-Chandra-	**PEER REVIEWED**
37	**Mobile robot path planning approach: A review**	Choudhury, R. K., Kumar, S., & **Samal, C. K.**	Computer Science	Internation al Journal of Advanced Scientific Research	2017	2455-6378	UGC Journal No. 63502	**https://ijasrm.com/issues/volume-2-issue-8/**	https://ijasrm.com/issues/volume-2-issue-8/	**PEER REVIEWED**
38	**Architecture based on environmental monitoring system using zigbee wireless sensor networks**	**Samal, C. K.** & Choudhury, R. K.	Computer Science	Journal of Advanced Scientific Research and	2017	2455-6378	UGC Journal No. 63502	**https://ijasrm.com/issues/volume-2-issue-8/**	https://ijasrm.com/issues/volume-2-issue-8/	**PEER REVIEWED**

39	**Low power consumption in zigbee wireless networks: A, review**	**Samal, C. K.,** Choudhury, R. K., Kumar, V., & Mishra, S.	Computer Science	International Journal of Advance Engineering and	2017	2348-4470	UGC Journal No. 44839	https://issuu.com/editorijaerd/docs/low_power_consumption_in_zigbee_wir	https://issuu.com/editorijaerd/docs/low_power_consumption_in_zigbee_wir	**PEER REVIEWED**
40	**Society and Sex Work in *The Autobiography of a Sex Worker by* Nalini Jameela.**	**Garg, M. K.**	English	Language in India	2017	1930-2940	http://www.languageinindia.com/july2017/v17i7july2017.pdf	http://www.languageinindia.com/july2017/v17i7july2017.pdf	http://www.languageinindia.com/july2017/v17i7july2017.pdf	**PEER REVIEWED**
41	**The White Woman's Gaze**	**Rakshit, J. D.**	English	International Journal of English Language, Literature in	2017	2321-7065	http://www.ijellh.com/the-white-womans-gaze	http://www.ijellh.com/the-white-womans-gaze	http://www.ijellh.com/the-white-womans-gaze	**PEER REVIEWED**
42	**Free and open source software: A key enabler for digital India**	Ranjan Kumar, **Subhash Kumar**, Sanjay K. Tiwari	Physics	South Asia Journal of Multidisciplinary Studies,	2017	0973-4562	https://pubs.aip.org/aip/pop/article-split/24/8/082111/2122	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	**PEER REVIEWED**
43	**Free and open source software: A key enabler for digital India**	Ranjan Kumar**,** Subhash Kumar, **Sanjay K. Tiwari**	Physics	South Asia Journal of Multidisciplinary Studies,	2017	0973-4562	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	**PEER REVIEWED**
44	**Nanosecond Laser- Cluster Interactions at 109-1012 W/cm2**	**Rohtash Singh,** V. K. Tripathi, R. K. Vatsa, and D. Das	Physics	Phys. Plasmas 24, 082111	2017	1089-7674	https://doi.org/10.1063/1.4997452	https://pubs.aip.org/aip/pop/article-split/24/8/082111/212250/Nanos	https://pubs.aip.org/aip/pop/article-split/24/8/082111/212250/Nanosecond-laser-cluster-interactions-at-	**SCOPUS INDEXED**
45	**Pulse compression and self focusing of Gaussian laser pulses in plasma having relativistic ponderomotive nonlinearity**	S. Kumar, **P. K. Gupta,** R. K. Singh, S. Sharma, R. Uma and R. P. Sharma	Physics	Laser and particle beams 35, 429	2017	0263-0346	https://doi.org/10.1017/S0263034617000416	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/ab	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/pulsecompression-and-	**SCOPUS INDEXED**
46	**Detection of liquefied petroleum gas below lowest explosion limit (LEL) using nanostructured hexagonal strontium ferrite thin film**	M. Singh, B.C. Yadav, A. Ranjan, **Rakesh Kumar Sonker**, M. Kaur	Physics	Sens. Act. B: Chemi. 249, 96-104	2017	1872-6291	https://doi.org/10.1016/j.snb.2017.04.075	https://www.sciencedirect.com/science/article/abs/pii/S0925400517306755	https://www.sciencedirect.com/science/article/abs/pii/S0925400517306755?via%3Dihub	**SCOPUS INDEXED**

47	**Growth and characterization of sol-gel processed rectangular shaped nanostructured ferric oxide thin film followed by**	B.C. Yadav, K. S. Chauhan, S. Singh, **Rakesh Kumar Sonker**, S. Sikarwar and	Physics	J. Mater. Sci: Mater Electron., 28 , 5270-5280	2017	0957-4522	DOI 10.1007/s10854-016-6184-8	https://link.springer.com/article/10.1007/s10854-016-6184-8	https://link.springer.com/article/10.1007/s10854-016-6184-8	**SCOPUS INDEXED**
48	**LPG detection using SnO_2, PANI-SnO_2 and Ag-SnO_2 composite film fabricated by Chemical route**	**Rakesh Kumar Sonker,** S.R. Sabhajeet, B.C. Yadav, Rahul Johari	Physics	Int. J. Electroactive Mater. 5, 6-12	2017	1936-7317	http://dx.doi.org/10.1166/asl.2014.5476	https://www.electroactmater.com/download.php?pdf=5-1-6-12.pdf	https://www.electroactmater.com/download.php?pdf=5-1-6-12.pdfhttps://www.ingentaconnect.com/cont	**PEER REVIEWED**
49	**Preparation of PANI doped TiO_2 nanocomposite thin film and its relevance as room temperature liquefied petroleum gas sensor**	**Rakesh Kumar Sonker,** S.R. Sabhajeet, B. C. Yadav	Physics	J. Mater. Sci: Mater Electron., 28, 14471–144	2017	0957-4522	DOI 10.1007/s10854-017-7309-4	https://link.springer.com/article/10.1007/s10854-017-7309-4	https://link.springer.com/article/10.1007/s10854-017-7309-4	**SCOPUS INDEXED**
50	**Development of Fe_2O_3-PANI nanocomposite thin film based sensor for NO_2 detection**	**Rakesh Kumar Sonker,** B. C. Yadav	Physics	J. Taiwan Ins. of Chemical Eng., 77, 276-281	2017	1872-6291	https://doi.org/10.1016/j.jtice.2017.04.042	https://www.sciencedirect.com/science/article/abs/pii/S1876107017302262	https://www.sciencedirect.com/science/article/abs/pii/S1876107017302262	**SCOPUS INDEXED**
51	**Self-compression of two co-propagating laser pulse having relativistic nonlinearity in plasma**	S. Kumar, **P. K. Gupta,** R. K. Singh, S. Sharma, R. Uma and R. P. Sharma	Physics	Laser and particle beams 35,	2017	0263-0346	https://doi.org/10.1017/S0263034617000787	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/ab	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/abs/self compression-of-two-	**SCOPUS INDEXED**
52	**Partially synchronized states in an ensemble of chemo-mechanical oscillators**	**P Kumar,** DK Verma, P Parmananda	Physics	Physics letters A	2017	0020-0255	https://doi.org/10.1016/j.physleta.2017.05.032	https://www.sciencedirect.com/science/article/pii/S0375960116311896	https://www.sciencedirect.com/science/article/pii/S0375960116311896	**SCOPUS INDEXED**
53	**Partially synchronized states in an ensemble of chemo-mechanical oscillators**	P Kumar, **DK Verma,** P Parmananda	Physics	Physics letters A	2017	0020-0255	https://doi.org/10.1016/j.physleta.2017.05.032	https://www.sciencedirect.com/science/article/pii/S0375960116311896	https://www.sciencedirect.com/science/article/pii/S0375960116311896	**SCOPUS INDEXED**
54	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	**Kumar, S.,** Warikoo, R., Mishra, M., Samal, R. R., Rana, S., Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-thesurvival-and	**PEER REVIEWED**

55	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	Kumar, S., Warikoo, R., Mishra, M., Samal, R. R., **Rana, S.,** Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
56	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	Kumar, S., Warikoo, R., **Mishra, M.,** Samal, R. R., Rana, S., Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
57	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	Kumar, S., Warikoo, R., Mishra, M., **Samal, R. R.**, Rana, S., Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
58	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	Kumar, S., Warikoo, R., Mishra, M., Samal, R. R., Rana, S., Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
59	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	Kumar, S., Warikoo, R., Mishra, M., Samal, R. R., Rana, S., Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
60	**Impact of *Ocimum basilicum* leaf essential oil on the survival and behaviour of an Indian strain of Dengue Vector, *Aedes aegypti L.***	Kumar, S., Warikoo, R., Mishra, M., Samal, R. R., Rana, S., Panmei, K.	Zoology	Vector Biology Journal	2017	2473-4810	https://doi.org/10.4172/2473-4810.1000122	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-	https://www.scitechnol.com/peer-review/impact-of-ocimum-basilicum-leaf-essential-oil-on-	**PEER REVIEWED**
61	***Pseudomonas aeruginosa:* Isolation, characterization and evaluation of larvicidal efficacy against *Aedes aegypti* L.**	**Shukla, R. K.**, Kumar, S., & Tripathi, P.	Zoology	European *Journal of Biomedical and Pharmaceu*	2017	2349-8870	https://www.ejbps.com/ejbps/abstract_id/3088	https://www.ejbps.com/ejbps/abstract_id/3088	https://www.ejbps.com/ejbps/abstract_id/3088	**PEER REVIEWED**
62	***Pseudomonas aeruginosa:* Isolation, characterization and evaluation of larvicidal efficacy against *Aedes aegypti* L.**	Shukla, R. K., **Kumar, S.,** & Tripathi, P.	Zoology	European *Journal of Biomedical and Pharmaceu*	2017	2349-8870	https://www.ejbps.com/ejbps/abstract_id/3088	https://www.ejbps.com/ejbps/abstract_id/3088	https://www.ejbps.com/ejbps/abstract_id/3088	**PEER REVIEWED**

63	**Bioprospecting xylanase enzymes from diverse ecological habitats**	Das, P., Kumar, P., Kumar M., Solanki, R., & **Kapur, M. K**.	Zoology	International Research Journal of Natural and Applied	2017	2349-4077	https://www.researchgate.net/publication/328261822_BIOP	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZYMES_FROM_DIVERSE	**PEER REVIEWED**
64	**Bioprospecting xylanase enzymes from diverse ecological habitats**	Das, P., Kumar, P., Kumar M., **Solanki, R.,** & Kapur, M. K.	Zoology	International Research Journal of Natural and Applied	2017	2349-4077	https://www.researchgate.net/publication/328261822_BIOP	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZYMES_FROM_DIVERSE	**PEER REVIEWED**
65	**Bioprospecting xylanase enzymes from diverse ecological habitats**	**Das, P**., Kumar, P., Kumar M., Solanki, R., & Kapur, M. K.	Zoology	International Research Journal of Natural and Applied	2017	2349-4077	https://www.researchgate.net/publication/328261822_BIOP	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZYMES_FROM_DIVERSE	**PEER REVIEWED**
66	**Bioprospecting xylanase enzymes from diverse ecological habitats**	Das, P., Kumar, **P., Kumar** M., Solanki, R., & Kapur, M. K.	Zoology	International Research Journal of Natural and Applied	2017	2349-4077	https://www.researchgate.net/publication/328261822_BIOP	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE	https://www.researchgate.net/publication/328261822_BIOPROSPECTING_XYLANASE_ENZYMES_FROM_DIVERSE	**PEER REVIEWED**
67	**Purification and molecular characterization of chitinases from soil actinomycetes**	Das, P., Kumar, P., **Kumar, M.**, Solanki, R., & Kapur, M. K.	Zoology	African Journal of Microbiology Research	2017	1996-0808	http://dx.doi.org/10.5897/AJMR2017.8612	https://www.researchgate.net/journal/African-Journal-of-Microbiology-	https://www.researchgate.net/journal/African-Journal-of-Microbiology-Research-1996-0808	**PEER REVIEWED**
68	**Purification and molecular characterization of chitinases from soil actinomycetes**	Das, P., Kumar, P., Kumar, M., Solanki, R., & **Kapur, M. K.**	Zoology	African Journal of Microbiology Research	2017	1996-0808	http://dx.doi.org/10.5897/AJMR2017.8612	https://www.researchgate.net/journal/African-Journal-of-Microbiology-	https://www.researchgate.net/journal/African-Journal-of-Microbiology-Research-1996-0808	**PEER REVIEWED**
69	**Purification and molecular characterization of chitinases from soil actinomycetes**	**Das, P**., Kumar, P., Kumar, M., Solanki, R., & Kapur, M. K.	Zoology	African Journal of Microbiology Research	2017	1996-0808	http://dx.doi.org/10.5897/AJMR2017.8612	https://www.researchgate.net/journal/African-Journal-of-Microbiology-	https://www.researchgate.net/journal/African-Journal-of-Microbiology-Research-1996-0808	**PEER REVIEWED**
70	**Purification and molecular characterization of chitinases from soil actinomycetes**	Das, P., Kumar, P., Kumar, M., **Solanki, R**., & Kapur, M. K.	Zoology	African Journal of Microbiology Research	2017	1996-0808	http://dx.doi.org/10.5897/AJMR2017.8612	https://www.researchgate.net/journal/African-Journal-of-Microbiology-	https://www.researchgate.net/journal/African-Journal-of-Microbiology-Research-1996-0808	**PEER REVIEWED**

71	**Crystal structure of UDP-N-acetylglucosamine-enolpyruvate reductase (MurB) from Mycobacterium tuberculosis**	Eniyan, K., Dharavath, S., Vijayan, R., **Bajpai, U**., & Gourinath, S	Biomedical Science	Biochimica et Biophysica Acta (BBA)-Proteins	2018	1.6E+07	https://doi.org/10.1016/j.bbapap.2017.11.013	https://www.sciencedirect.com/science/article/abs/pii/S1570963917302819?via%3D	https://mjl.clarivate.com:/search-results?issn=1570-9639&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
72	**Crystal structure of UDP-N-acetylglucosamine-enolpyruvate reductase (MurB) from Mycobacterium tuberculosis**	**Eniyan, K**., Dharavath, S., Vijayan, R., Bajpai, U., & Gourinath, S	Biomedical Science	Biochimica et Biophysica Acta (BBA)-Proteins	2018	1.6E+07	https://doi.org/10.1016/j.bbapap.2017.11.013	https://www.sciencedirect.com/science/article/abs/pii/S1570963917302819?via%3D	https://mjl.clarivate.com:/search-results?issn=1570-9639&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
73	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
74	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
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76	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
77	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
78	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

79	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
80	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
81	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
82	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
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84	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
85	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	**Bajpai, U.**, Mehta, A. K., Eniyan, K., Sinha, A., Ray, A., Virdi, S., Ahmad, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
86	**Isolation and characterization of bacteriophages from India, with lytic activity against Mycobacterium tuberculosis.**	Bajpai, U., Mehta, A. K., **Eniyan, K.**, Sinha, A., Ray, A., Virdi, S.,	Biomedical Science	Canadian Journal of Microbiology	2018	0008-4166	https://doi.org/10.1139/cjm-2017-0387	https://cdnsciencepub.com/doi/10.1139/cjm-2017-0387	https://mjl.clarivate.com:/search-results?issn=0008-4166&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

87	**Microwave assisted synthesis of spiro heterocyclic systems: A review**	**Khanna, P.**, Khanna, L., Thomas, S. J., Asiri, A. M., & Panda, S. S.	Chemistry	Current organic chemistry	2018	1385-2728	10.2174/1385272821666170818161517	https://www.eurekaselect.com/article/85367	https://mjl.clarivate.com:/search-results?issn=1385-2728&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
88	**An analysis of replenishment model of deteriorating items with ramp-type demand and trade credit under the learning effect**	Sharma, A., Sharma, U., & **Singh, C.**	Mathematics	International Journal of Procurement Manageme	2018	1.8E+07	https://doi.org/10.1504/IJPM.2018.091668	https://www.inderscienceonline.com/doi/abs/10.1504/IJPM.2018.091668	https://www.scopus.com/sourceid/21100242236	Indexed in UGC Care List and SCOPUS
89	**Controlling room temperature ferromagnetism and band gap in ZnO nanostructured thin films by varying angle of implantation**	Hariwal, V, R., Malik, H. K., **Negi, A.**, & Kandasami, A	Physics	RSC Advances	2018	2046-2069	https://doi.org/10.1039/C7RA10615G	https://pubs.rsc.org/en/content/articlelanding/2018/RA/C7RA10615G	https://mjl.clarivate.com:/search-results?issn=2046-2069&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
90	**Emamectin Benzoate: Potential larvicide and antifeedant agent against cotton boll worm Helicoverpa armigera**	Dagar, V. S., & **Kumar, S.**	Zoology	Journal of Applied and Natural Sciences	2018	2231-5209	https://doi.org/10.31018/jans.v10i2.1738	https://journals.ansfoundation.org/index.php/jans/article/view/1738	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
91	**Emamectin Benzoate: Potential larvicide and antifeedant agent against cotton boll worm Helicoverpa armigera**	**Dagar, V. S.**, & Kumar, S.	Zoology	Journal of Applied and Natural Sciences	2018	2231-5209	https://doi.org/10.31018/jans.v10i2.1738	https://journals.ansfoundation.org/index.php/jans/article/view/1738	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
92	**Sld5 Ensures centrosomal resistance to congression forces by preserving centriolar satellites.**	Kaur, M., Devi, R., Ghosh, T., Khan, M. M., Kumar, P., Kar, P. A., **Sharma,**	Zoology	Molecular and Cellular Biology,	2018	0270-7306	https://doi.org/10.1128/MCB.00371-17	https://journals.asm.org/doi/10.1128/MCB.00371-17	https://mjl.clarivate.com:/search-results?issn=0270-7306&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
93	**The study of effect of various temperatures on the abundance of ammonia oxidizing archaea and bacteria.**	**Khangembam, C. D.**, Singh, S. P., Sharma, J. G., & Chakrabarti, R.	Zoology	The Indian Journal of Animal Science	2018	0367-8318	10.56093/ijans.v88i5.80023	https://www.researchgate.net/profile/Rina-Chakrabarti/publication/32562607	https://mjl.clarivate.com:/search-results?issn=0367-8318&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
94	**Estimating the parameter of selected uniform population under the squared log error loss function**	**Meena, K.R.,** Mohd Arshad, & Gangopadhyay, A. K.	Mathematics	Communications in Statistics-Theory and Methods	2018	1532-415X	https://doi.org/10.1080/03610926.2017.1324986	https://www.tandfonline.com/doi/abs/10.1080/03610926.2017.1324986?journalCod	https://mjl.clarivate.com/search-results?issn=0361-0926&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science

95	**Cellular and molecular basis of heavy metal induced stress in ciliates: A review**	Sripoorna, S., Abraham, J. S., Maurya, S., **Makhija, S.**, Gupta, R., &	Zoology	Current Science	2018	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/114/09/1858.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
96	**Cellular and molecular basis of heavy metal induced stress in ciliates: A review**	**Sripoorna**, S., Abraham, J. S., Maurya, S., Makhija, S., Gupta, R., &	Zoology	Current Science	2018	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/114/09/1858.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
97	**Cellular and molecular basis of heavy metal induced stress in ciliates: A review**	Sripoorna, S., **Abraham, J.** S., Maurya, S., Makhija, S., Gupta, R., &	Zoology	Current Science	2018	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/114/09/1858.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
98	**Cellular and molecular basis of heavy metal induced stress in ciliates: A review**	Sripoorna, S., Abraham, J. S., Maurya, S., Makhija, S., Gupta, R., &	Zoology	Current Science	2018	0011-3891	https://www.jstor.org/stable/26494927 / https://ww	https://www.currentscience.ac.in/Volumes/114/09/1858.pdf	https://mjl.clarivate.com:/search-results?issn=0011-3891&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
99	**Floral contrivances and specialised pollination mechanism strongly influence mixed mating in Wrightia tomentosa**	Barman, C., **Singh, V.K.**, Das, S. & Tandon, R.	Botany	Plant Biology	2018	Online ISSN: 1438-8677	https://doi.o	https://onlinelibrary.wiley.com/doi/10.1111/plb.12690	https://mjl.clarivate.com/search-results?issn=1435-8603&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
100	**Relative contribution of reproductive attributes to the density-dependent effects on fruit-set.**	**Singh VK**, C Barman, D Mohanty D & Tandon R	Botany	AoB PLANTS	2018	ISSN:2041-2851	https://doi.o	https://academic.oup.com/aobpla/article/10/2/ply019/4931735	https://www.scopus.com/sourceid/21100285035	Indexed in UGC Care List, SCOPUS and Web of Science
101	**Heteroleptic metal(II) complexes of curcumin and 2,2'-bipyridine: Synthesis, characterization, molecular modeling and preliminary**	Lal S., Joshi M. C., **Hooda,S.** & Kumar,V.	Chemistry	Rev. Roum. Chim.	2018	ISSN: 0035-3930	https://revro	https://revroum.lew.ro/wp-content/uploads/2018/04/Art%2006.pdf	https://www.scopus.com/sourceid/21508	Indexed in UGC Care List, SCOPUS and Web of Science
102	**Heteroleptic metal(II) complexes of curcumin and 2,2'-bipyridine: Synthesis, characterization, molecular modeling and preliminary**	Lal S., Joshi M. C., Hooda,S. & **Kumar,V.**	Chemistry	Rev. Roum. Chim.	2018	ISSN: 0035-3930	https://revro	https://revroum.lew.ro/wp-content/uploads/2018/04/Art%2006.pdf	https://www.scopus.com/sourceid/21508	Indexed in UGC Care List, SCOPUS and Web of Science

103	**Heteroleptic metal(II) complexes of curcumin and 2,2'-bipyridine: Synthesis, characterization, molecular modeling and preliminary**	**Lal S.**, Joshi M. C., Hooda,S. & Kumar,V.	Chemistry	Rev. Roum. Chim.	2018	ISSN: 0035-3930	https://revro	https://revroum.lew.ro/wp-content/uploads/2018/04/Art%2006.pdf	https://www.scopus.com/sourceid/21508	Indexed in UGC Care List, SCOPUS and Web of Science
104	**A highly selective sensor Cu2+ and Fe3+ ions in aqueous medium: Spectroscopic, computational and cell imaging studies.**	Lal S., Kumar S., **Hooda, S.** & Kumar P.	Chemistry	Journal of Photochemistry and Photobiology A:	2018	1010-6030	https://doi.o	https://www.sciencedirect.com/science/article/abs/pii/S1010603018305501	https://www.scopus.com/sourceid/26966	Indexed in UGC Care List and SCOPUS
105	**A highly selective sensor Cu2+ and Fe3+ ions in aqueous medium: Spectroscopic, computational and cell imaging studies.**	**Lal S.**, Kumar S., Hooda, S. & Kumar P.	Chemistry	Journal of Photochemistry and Photobiology A:	2018	1010-6030	https://doi.o	https://www.sciencedirect.com/science/article/abs/pii/S1010603018305501	https://www.scopus.com/sourceid/26966	Indexed in UGC Care List and SCOPUS
106	**Protective effects of Aporosa octandra bark extract against D-galactose induced cognitive impairment and oxidative stress in mice.**	Panda S.S., Girgis A-S., Prakash A., Khanna L., **Khanna, P.**, Shalaby El-S. M.,	Chemistry	Heliyon	2018	2405-8440(Online)	https://doi.o	https://www.cell.com/heliyon/fulltext/S2405-8440(18)34864-3?_returnURL=ht	https://www.scopus.com/sourceid/21100411756	Indexed in UGC Care List, SCOPUS and Web of Science
107	**Social Centrality using network hierarchy and community structure.**	Saxena R., **Kaur, S.**, Bhatnagar V.	Computer Science	Data Mining and Knowledge Discovery	2018	1384-5810	https://doi.o	https://link.springer.com/article/10.1007/s10618-018-0582-x#:~:text=Social%	https://mjl.clarivate.com:/search-results?issn=1384-5810&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
108	**Bandwidth Efficient Broadcast Protocols in MANETs: A Review**	**Samal, C. K.** , Choudhury R. K.	Computer Science	International Journal of Computer Sciences and	2018	2347-2693	DOI:10.2643	https://www.ijcseonline.org/pdf_paper_view.php?paper_id=1632&8-IJCSE-	UGC Listed Journal 2019, Journal No:63193 https://www.ijcseonline.org/	Indexed in UGC Care List, SCOPUS and Web of Science
109	**Structural and optical properties of electrochemically deposited ZnOnanorods by using graphene oxide and ITO as**	Chetna, Kumar, S., **Garg, A.,** Chowdhuri, A., Jain, A., & Kapoor, A.	Electronics, Physics	Materials Research Express	2018	2053-1591	DOI 10.1088/	https://iopscience.iop.org/article/10.1088/2053-1591/aad7a5	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
110	**Structural and optical properties of electrochemically deposited ZnOnanorods by using graphene oxide and ITO as**	Chetna, **Kumar, S.**, Garg, A.**,** Chowdhuri, A., Jain, A., & Kapoor, A.	Electronics, Physics	Materials Research Express	2018	2053-1591	DOI 10.1088/	https://iopscience.iop.org/article/10.1088/2053-1591/aad7a5	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

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112	**Comparison of water purification properties of Graphene Oxide (GO) Membranes with tuned interlayer spacings,**	Kumar, S., **Garg, A., &** Chowdhuri, A**.**	Electronics, Physics	Materials Research Express	2019	2053-1591	DOI 10.1088/2053-1591/aae416	https://iopscience.iop.org/article/10.1088/2053-1591/aae416	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
113	**Comparison of water purification properties of Graphene Oxide (GO) Membranes with tuned interlayer spacings,**	Kumar, S., Garg, A., & **Chowdhuri, A.**	Electronics, Physics	Materials Research Express	2019	2053-1591	DOI 10.1088/2053-1591/aae416	https://iopscience.iop.org/article/10.1088/2053-1591/aae416	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
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115	**Sonication Effect on Graphene Oxide (GO) Membranes for Water Purification Applications"**	Kumar, S., **Garg, A.**, & Chowdhuri, A.	Electronics, Physics	Materials Research Express	2019	2053-1591	DOI 10.1088/2053-1591/ab1ffd	https://iopscience.iop.org/article/10.1088/2053-1591/ab1ffd#:~:text=It%20is%20n	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
116	**Sonication Effect on Graphene Oxide (GO) Membranes for Water Purification Applications"**	Kumar, S., Garg, A., & **Chowdhuri, A.**	Electronics, Physics	Materials Research Express	2019	2053-1591	DOI 10.1088/2053-1591/ab1ffd	https://iopscience.iop.org/article/10.1088/2053-1591/ab1ffd#:~:text=It%20is%20n	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
117	**Sonication Effect on Graphene Oxide (GO) Membranes for Water Purification Applications"**	**Kumar, S.**, Garg, A., & Chowdhuri, A.	Electronics, Physics	Materials Research Express	2019	2053-1591	DOI 10.1088/2053-1591/ab1ffd	https://iopscience.iop.org/article/10.1088/2053-1591/ab1ffd#:~:text=It%20is%20n	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
118	**Circular restricted three-body problem when both the primaries are heterogeneous spheroid of three layers and infinitesimal body varies its**	Ansari, A. A., Alhussain, Z. A., & **Prasad, S. N.**	Mathematics	Journal of Astrophysics and Astronomy	2018	0973-7758	https://doi.org/10.1007/s12036-018-9540-7	https://link.springer.com/article/10.1007/s12036-018-9540-7	https://mjl.clarivate.com/search-results?issn=0250-6335&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

119	**An EOQ Model for Deteriorating Items with Selling Price Dependent Exponential Demand for Time Varying Holding and**	Verma, S. K., Mohd. Rizwanullah, & **Singh, C.**	Mathematics	International Journal of Engineering & Technology	2018	2227-524X	https://doi.o	https://www.sciencepubco.com/index.php/ijet/article/view/24294	https://www.scopus.com/sourceid/21100805731	Indexed in SCOPUS
120	**A production inventory model with selling price and stock sensitive demand under partial backlogging**	**Aarya, D. D.** & Kumar, M.	Mathematics	International Journal of Mathematics in Operational	2018	1757-5850	https://doi.o	https://www.inderscienceonline.com/doi/abs/10.1504/IJMOR.2018.090802	https://www.scopus.com/sourceid/21100202502	Indexed in UGC-Care List and SCOPUS
121	**Susceptability status of Aedes aegypti L. against different classes of insecticides in New Delhi, India to formulate mosquito**	**Samal, R. R.** & Kumar, S.	Zoology	Open Parasitology Journal	2018	1874-4214	DOI: 10.2174	https://openparasitologyjournal.com/VOLUME/6/PAGE/52/ABSTRACT/	https://www.scopus.com/sourceid/21100205964	Indexed in SCOPUS
122	**Susceptability status of Aedes aegypti L. against different classes of insecticides in New Delhi, India to formulate mosquito**	Samal, R. R. & **Kumar, S.**	Zoology	Open Parasitology Journal	2018	1874-4214	DOI: 10.2174	https://openparasitologyjournal.com/VOLUME/6/PAGE/52/ABSTRACT/	https://www.scopus.com/sourceid/21100205964	Indexed in SCOPUS
123	**Effects of Achyranthes aspera extracts on the survival and midgut histo-architecture of Aedes aegypti L. early IV instars.**	Sharma, A., **Kumar, S.,** & Tripathi, P.	Zoology	Open Parasitology Journal	2018	1874-4215	DOI: 10.2174	https://openparasitologyjournal.com/VOLUME/6/PAGE/41/FULLTEXT/	https://www.scopus.com/sourceid/21100205964	Indexed in SCOPUS
124	**Effects of Achyranthes aspera extracts on the survival and midgut histo-architecture of Aedes aegypti L. early IV instars.**	**Sharma, A.**, Kumar, S**.,** & Tripathi, P.	Zoology	Open Parasitology Journal	2018	1874-4215	DOI: 10.2174	https://openparasitologyjournal.com/VOLUME/6/PAGE/41/FULLTEXT/	https://www.scopus.com/sourceid/21100205964	Indexed in SCOPUS
125	**Growth regulatory and growth inhibitory effects of Thevetia neriifolia stem extracts on Helicoverpa armigera (Lepidoptera:**	Mishra, M.**,** Gupta, K.K., & **Kumar, S.**	Zoology	Archives of Phytopathology and Plant Protection	2018	0323-5408	https://doi.org/10.1080/03235408.2018.1521324	https://www.tandfonline.com/doi/abs/10.1080/03235408.2018.1521324?journalCod	https://mjl.clarivate.com:/search-results?issn=0323-5408&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
126	**Growth regulatory and growth inhibitory effects of Thevetia neriifolia stem extracts on Helicoverpa armigera (Lepidoptera:**	**Mishra, M.,** Gupta, K.K., & Kumar, S.	Zoology	Archives of Phytopathology and Plant Protection	2018	0323-5408	https://doi.org/10.1080/03235408.2018.1521324	https://www.tandfonline.com/doi/abs/10.1080/03235408.2018.1521324?journalCod	https://mjl.clarivate.com:/search-results?issn=0323-5408&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

127	**Modelling of Pinning-Depinning Reversal Mechanism in Ion-Irradiated Co/Al2O3 Thin Films.**	Goyal, R., Gupta, R., **Negi, A.,** Asokan, K., Kanjilal, D., Lamba, S., &	Physics	Physica Status Solidi (A) Applications And	2018	1862-6300	https://doi.o	https://onlinelibrary.wiley.com/doi/10.1002/pssa.201800141	https://mjl.clarivate.com/search-results?issn=1862-6300&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
128	**Polarization dependent charge control model for microwave performance assessment of AlGaN/GaN/AlGaN double**	Chugh, N., **Bhattacharya, M.**, Kumar, M., Deswal, S. S., & Gupta, R. S.	Electronics	Journal of Computational Electronics	2018	1569-8025	https://doi.org/10.1007/s10825-018-1190-0	https://link.springer.com/article/10.1007/s10825-018-1190-0	https://mjl.clarivate.com/search-results?issn=1569-8025&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
129	**Larvicidal activities of petroleum ether extracts of different fruit peel wastes against an Indian strain of filarial vector, *Culex***	**Shrankhla,** & Kumar, S**.**	Zoology	European Journal of Biomedical and Pharmaceut	2018	2349-8870	https://www.ejbps.com/ejbps/abstract_id/3948	https://www.ejbps.com/ejbps/abstract_id/3948	https://www.ejbps.com/ejbps/abstract_id/3948	**PEER REVIEWED**
130	**Larvicidal activities of petroleum ether extracts of different fruit peel wastes against an Indian strain of filarial vector, *Culex***	Shrankhla, & **Kumar, S**.	Zoology	European Journal of Biomedical and Pharmaceut	2018	2349-8870	https://www.ejbps.com/ejbps/abstract_id/3948	https://www.ejbps.com/ejbps/abstract_id/3948	https://www.ejbps.com/ejbps/abstract_id/3948	**PEER REVIEWED**
131	**Role of gold and silver nanoparticles in cancer nano-medicine**	Chugh, H., Sood, D., Chandra, I., Tomar, V., **Dhawan G**.& Chandra, R.	Biomedical Science	Artificial Cells, Nanomedicine, and Biotechnolo	2018	1210-1220	DOI: 10.1080	https://pubmed.ncbi.nlm.nih.gov/29533101/	https://pubmed.ncbi.nlm.nih.gov/29533101/	**SCOPUS INDEXED**
132	**Gauging the nature and magnitude of Particulate Matter (PM) concentrations in Bengaluru, the IT capital of India**	**Gupta, *C. K;*** Singh, J. P; Chopra, P; Raj, V. B; Chowdhuri, A.	Botany, Physics, Physics	DU Journal of Undergraduate Research	2018	2395 - 2334	https://journals.du.ac.in/ugresearch/vol3_2.html	https://journals.du.ac.in/ugresearch/	https://journals.du.ac.in/ugresearch/vol3_2.html	**PEER REVIEWED**
133	**Gauging the nature and magnitude of Particulate Matter (PM) concentrations in Bengaluru, the IT capital of India**	Gupta, *C. K;* Singh, J. P; Chopra, P; **Raj, V. B;** Chowdhuri, A.	Botany, Physics, Physics	DU Journal of Undergraduate Research	2018	2395 - 2334	https://journals.du.ac.in/ugresearch/vol3_2.html	https://journals.du.ac.in/ugresearch/	https://journals.du.ac.in/ugresearch/vol3_2.html	**PEER REVIEWED**
134	**Gauging the nature and magnitude of Particulate Matter (PM) concentrations in Bengaluru, the IT capital of India**	**Gupta,** *C. K;* Singh, J. P; Chopra, P; **Raj, V. B; Chowdhuri, A.**	Botany, Physics, Physics	DU Journal of Undergraduate Research	2018	2395 - 2334	https://journals.du.ac.in/ugresearch/vol3_2.html	https://journals.du.ac.in/ugresearch/	https://journals.du.ac.in/ugresearch/vol3_2.html	**PEER REVIEWED**

135	**A concise synthesis of 2-ALKENYL-3- phenyl-4H-chromen-4-ones via novel C-C bond formation using sulfone as potential**	Khanna, L., **Khanna, P**. and Jain, S.C.	Chemistry	Ind. J. Chem	2018	2583-1321	https://www.researchgate.net/publication/326693392_A_co	https://www.researchgate.net/publication/326693392_A_concise_synthesis_of_2-	https://www.researchgate.net/publication/326693392_A_concise_synthesis_of_2-alkenyl-3-phenyl-4H-chromen-	**SCOPUS INDEXED**
136	**Geometry of the Large Magellanic Cloud using multiwavelength photometry of classical Cepheids**	Sukanta Deb, Chow-Choong Ngeow, Shashi M Kanbur, Harinder P	Physics	Monthly Notices of the Royal Astronomical Society	2018	2526–2540	https://doi.org/10.1093/mnras/sty1124	https://academic.oup.com/mnras/article/478/2/2526/4992330	https://academic.oup.com/mnras/article/478/2/2526/4992330	**SCOPUS INDEXED**
137	**Adoption of Free and Open Source Software in India,**	Ranjan Kumar, **Subhash Kumar,** Sanjay K. Tiwari	Physics	International Journal of Applied Engineering Research	2018	0973-4562	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	**PEER REVIEWED**
138	**Adoption of Free and Open Source Software in India,**	Ranjan Kumar, Subhash Kumar, **Sanjay K. Tiwari**	Physics	International Journal of Applied Engineering Research	2018	0973-4562	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	https://www.ripublication.com/ijaer18/ijaerv13n16_44.pdf	**PEER REVIEWED**
139	**Spherical growth of nanostructures ZnO based optical sensing and photovoltaic application**	**Rakesh Kumar Sonker**, S. Sikarwar, S.R. Sabhajeet, Rahul, B.C.	Physics	Optical Materials, 83, 342-347	2018	1872-6291	https://doi.org/10.1016/j.optmat.2018.06.046	https://www.sciencedirect.com/science/article/abs/pii/S0925346718304269	https://www.sciencedirect.com/science/article/abs/pii/S0925346718304269	**SCOPUS INDEXED**
140	**Study of electrical, dielectric and EMI shielding behavior of copper metal, copper ferrite and PVDF composite**	K.K. Halder, **Rakesh Kumar Sonker**, V.K. Sachdev, Monika Tomar, Vinay	Physics	Integrated Ferroelectrics, 194 (2018) 78-85	2018	1067-8489	https://doi.org/10.1080/10584587.2018.1514879	https://www.tandfonline.com/doi/abs/10.1080/10584587.2018.1514879	https://www.tandfonline.com/doi/abs/10.1080/10584587.2018.1514879	**SCOPUS INDEXED**
141	**Zn-Doped TiO_2 Nanoparticles Employed as Room Temperature Liquefied Petroleum Gas Sensor**	S.R. Sabhajeet, **Rakesh Kumar Sonker**, B.C. Yadav	Physics	Advanced Science, Engineering and Medicine,	2018	2164-6635	https://doi.org/10.1166/asem.2018.2249	https://www.ingentaconnect.com/content/asp/asem/2018/00000010/f0020007/art0	https://www.ingentaconnect.com/content/asp/asem/2018/00000010/f0020007/art00020;jsessionid=1uc7qj3kxg	**PEER REVIEWED**
142	**Synthesis and investigation of cubical shaped barium titanate and its application as opto-electronic humidity sensor**	S. Sikarwar, **Rakesh Kumar Sonker**, A. Shukla, B.C. Yadav	Physics	J. Mater. Sci: Mater Electron., 29, 12951-12958	2018	2193-1801	https://doi.org/10.1007/s10854-018-9415-3	https://link.springer.com/article/10.1007/s10854-018-9415-3	https://link.springer.com/article/10.1007/s10854-018-9415-3	**SCOPUS INDEXED**

143	**Less toxic tin incorporated perovskite solar cell using polymer electrolyte processed in the air**	Rahul, P.K. Singh, M. Parvaz, S. Ahmed, **Rakesh Kumar Sonker**, B.	Physics	Optik, 169, 166-171	2018	1872-6291	https://doi.org/10.1016/j.ijleo.2018.05.064	https://www.sciencedirect.com/science/article/pii/S0030402618307137	https://www.sciencedirect.com/science/article/pii/S0030402618307137	**SCOPUS INDEXED**
144	**Sol-gel formed spherical nanostructured titania based liquefied petroleum gas sensor**	S. Sabhajeet, B. Yadav, **Rakesh Kumar Sonker**	Physics	AIP Conference Proceedings, 1953, 030078	2018	1551-7616	https://doi.org/10.1063/1.5032413	https://pubs.aip.org/aip/acp/article-abstract/1953/1/030078/857970/	https://pubs.aip.org/aip/acp/article-abstract/1953/1/030078/857970/Sol-gel-formed-spherical-	**SCOPUS INDEXED**
145	**ZnO nanoneedle structure based dye-sensitized solar cell utilizing solid polymer electrolyte**	**Rakesh Kumar Sonker**, Rahul, S.R. Sabhajeet	Physics	Materials Letters, 223. 133-136	2018	1872-6291	https://doi.org/10.1016/j.matlet.2018.03.199	https://www.sciencedirect.com/science/article/pii/S0167577X18305809	https://www.sciencedirect.com/science/article/pii/S0167577X18305809	**SCOPUS INDEXED**
146	**Enhancement in self-compression due to co-propagating laser pulse in plasma**	S. Kumar, **P. K. Gupta**, R. Uma and R. P. Sharma	Physics	Optics Communications	2018	1872-6291	https://doi.org/10.1016/j.optcom.2018.06.023	https://www.sciencedirect.com/science/article/pii/S0030401818305145?via%3Dihub	https://www.sciencedirect.com/science/article/pii/S0030401818305145?via%3Dihub	**SCOPUS INDEXED**
147	**Dynamics of focused femtosecond Laser Pulse during photodisruption of crystalline lens**	**P. K. Gupta**, R. K. Singh and R. P. Sharma	Physics	Physics of Plasmas	2018	1089-7674	https://doi.o	https://pubs.aip.org/aip/pop/article/25/4/043121/904528/Dynamics-of-focused-	https://pubs.aip.org/aip/pop/article/25/4/043121/904528/Dynamics-of-focused-femtosecond-laser-	**SCOPUS INDEXED**
148	**Potential of Nardostachys jatamansi extracts to manage Indian strain of Aedes aegypti: A novel approach for vector control.**	Kumar, S., **Sharma, A.** & Warikoo, R.	Zoology	Vector Biology Journal	2018	2473-4810	10.4172/2473-4810.1000129	https://www.scitechnol.com/peer-review/potential-of-nardostachys-jatamansi-	nil	**PEER REVIEWED**
149	**Potential of Nardostachys jatamansi extracts to manage Indian strain of Aedes aegypti: A novel approach for vector control.**	Kumar, S., **Sharma, A.** & Warikoo, R.	Zoology	Vector Biology Journal	2018	2473-4810	10.4172/2473-4810.1000129	https://www.scitechnol.com/peer-review/potential-of-nardostachys-jatamansi-	nil	**PEER REVIEWED**
150	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**

151	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**
152	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**
153	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**
154	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**
155	**Gesture Recognizing Smart System**	Kumari, A; Abhijeet; Sharma, A; Baliyan, A. K; Kiran; & **Kaur, R.**	Electronics	DU Journal of Undergraduate Research	2018	2395-2334	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	https://journals.du.ac.in/ugresearch/pdf-vol-3_2/J1.pdf	nil	**PEER REVIEWED**
156	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R;	Chemistry	International Journal of Advanced Educational Research	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	nil	**PEER REVIEWED**
157	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R;	Chemistry	International Journal of Advanced Educational Research	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	nil	**PEER REVIEWED**
158	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R;	Chemistry	International Journal of Advanced Educational Research	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	nil	**PEER REVIEWED**

159	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R;	Chemistry	International Journal of Advanced Educational Research	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	nil	**PEER REVIEWED**
160	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R;	Chemistry	International Journal of Advanced Educational Research	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	nil	**PEER REVIEWED**
161	**Acrylonitrile copolymer based membrane sensor for selective detection of PB2+ ions in aqueous medium.**	Lal, S; **Hooda, S**; Kumar, A; Kumar, S; Singh, A; Singh, S; Chandra, R;	Chemistry	International Journal of Advanced Educational Research	2018	2455-6157	https://www.multidisciplinaryjournals.org/assets/archives/2	https://www.multidisciplinaryjournals.org/assets/archives/2018/vol3issue2/3-2-44-	nil	**PEER REVIEWED**
162	**Structure- guided Design and Development of Potent and Selective Dual Bromodomain 4 (BRD4)/Polo-like Kinase 1 (PLK1) Inhibitors**	Liu, S.; Yosief, H. O.; Dai, L.; Huang, H.; **Dhawan, G.;** Zhang, X.;	Biomedical Science	Journal of Medicinal Chemistry	2018	0022-2623	https://doi.org/10.1021/acs.jmedchem.8b00765	https://pubs.acs.org/doi/10.1021/acs.jmedchem.8b00765	https://mjl.clarivate.com:/search-results?issn=0022-2623&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
163	**Sequential [3+2] cycloaddition and [5+N] annulation reactions for modular synthesis of dihydrobenzoxazines,**	Muthengi, A.; Zhang, X.; **Dhawan, G.**; Zhang, W.; Corsini, F.;	Biomedical Science	Green Chemistry	2018	1463-9270	https://doi.org/10.1039/C8GC01099D	https://pubs.rsc.org/en/content/articlelanding/2018/gc/c8gc01099d	https://mjl.clarivate.com:/search-results?issn=1463-9262&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
164	**An Analysis on Recent Technological Developments in Green Chemistry: Biocatalytic Processes**	Sharma, S. P. & **Hooda, S.**	Chemistry	Journal of Advances and Scholarly Researches	2018	2230-7540	http://ipublisher.in/I/a/58228	http://ipublisher.in/I/a/58228	nil	**PEER REVIEWED**
165	**Sighting of Jamides bochus (Stoll, 1782) and Prosotas Nora (C. Felder 1860) (Insecta: Lepidoptera: Lycaenidae) From Urbanized**	**Chaudhary, R.** & **Kumar, V.**	Biomedical Science	Bionotes	2019	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://www.andcollege.du.ac.in/uploads/voiceofandc/BIONOTES.pdf	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
166	**Occurrence of subdioecy and scarcity of gender-specific markers reveal an ongoing transition to dioecy in Himalayan seabuckthorn**	**Mangla, Y.**, Das K, Bali S, Ambreen H, Raina SN, Tandon R, &	Botany	Heredity	2019	0018067X	https://doi.org/10.1038/s41437-018-0084-z	https://www.nature.com/articles/s41437-018-0084-z	https://www.scopus.com/sourceid/22235	Indexed in UGC Care List, SCOPUS and Web of Science

167	**Synchronization of fractional oder Rabinovich-Fabrikant systems using sliding mode control techniques**	Kumar, S., **Singh, C., Prasad**, **S. N.**, Shekhar, C., & Agarwal, R.	Mathematics	Archives of Control Sciences	2019	2300-2611	DOI:10.24425/acs.2019.129384	https://journals.pan.pl/dlibra/publication/129384/edition/112924/content	https://mjl.clarivate.com/search-results?issn=2300-2611&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
168	**Synchronization of fractional oder Rabinovich-Fabrikant systems using sliding mode control techniques**	Kumar, S., Singh, C., **Prasad**, **S. N.**, Shekhar, C., & Agarwal, R.	Mathematics	Archives of Control Sciences	2019	2300-2611	DOI:10.24425/acs.2019.129384	https://journals.pan.pl/dlibra/publication/129384/edition/112924/content	https://mjl.clarivate.com/search-results?issn=2300-2611&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
169	**An Optimal Policy for Deterministic Model for Time Proportional Deteriorated Inventory with Different Demand Rate Pattern**	Verma, S. K., Mohd. Rizwanullah, **& Singh, C.**	Mathematics	Journal of Advanced Research in Dynamical and Control	2019	1943-023X	DOI:10.13140/RG.2.2.25300.55682	https://www.jardcs.org/abstract.php?id=238#	https://www.scopus.com/sourceid/20500195215	Indexed in SCOPUS
170	**Influence of open educational resources on educational practices in the Global South**	**Kumar, S.**	Zoology	Nature Human Behaviour	2019	2397-3374	https://doi.org/10.1038/s41562-019-0624-4	https://www.nature.com/articles/s41562-019-0624-4	https://mjl.clarivate.com/search-results?issn=2397-3374&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
171	**Diminished Activity of Larval Midgut Transaminases and Phosphatases in Helicoverpa armigera Hübner (Lepidoptera) Induced by**	**Mishra, M.,** Gupta, K.K., & Kumar, S.	Zoology	Journal of the Lepidopterist's Society	2019	0024-0966	https://doi.org/10.18473/lepi.73i1.a4	https://bioone.org/journals/the-journal-of-the-lepidopterists-society/volume-	https://mjl.clarivate.com:/search-results?issn=0024-0966&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
172	**Diminished Activity of Larval Midgut Transaminases and Phosphatases in Helicoverpa armigera Hübner (Lepidoptera) Induced by**	Mishra, M., **Gupta, K.K.,** & Kumar, S.	Zoology	Journal of the Lepidopterist's Society	2019	0024-0966	https://doi.org/10.18473/lepi.73i1.a4	https://bioone.org/journals/the-journal-of-the-lepidopterists-society/volume-	https://mjl.clarivate.com:/search-results?issn=0024-0966&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
173	**Diminished Activity of Larval Midgut Transaminases and Phosphatases in Helicoverpa armigera Hübner (Lepidoptera) Induced by**	Mishra, M., Gupta, K.K., & **Kumar, S.**	Zoology	Journal of the Lepidopterist's Society	2019	0024-0966	https://doi.org/10.18473/lepi.73i1.a4	https://bioone.org/journals/the-journal-of-the-lepidopterists-society/volume-	https://mjl.clarivate.com:/search-results?issn=0024-0966&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
174	**Draft genome of Streptomyces sp.strain 130 and functional analysis of extracellular enzyme producing genes.**	Kumar, M., Kumar, P.**, Das, P.,** & Kapur, M.K.	Zoology	Molecular Biology Reports	2019	1573-4978	https://doi.org/10.1007/s11033-019-04960-y	https://link.springer.com/article/10.1007/s11033-019-04960-y	https://www.scopus.com/sourceid/14154	Indexed in SCOPUS

175	**Draft genome of Streptomyces sp.strain 130 and functional analysis of extracellular enzyme producing genes.**	Kumar, M., Kumar, P., Das, P., & **Kapur, M.K.**	Zoology	Molecular Biology Reports	2019	1573-4978	https://doi.org/10.1007/s11033-019-04960-y	https://link.springer.com/article/10.1007/s11033-019-04960-y	https://www.scopus.com/sourceid/14154	Indexed in SCOPUS
176	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X19300066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
177	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X19300066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
178	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X19300066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
179	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X19300066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
180	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X19300066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
181	**Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as**	Abraham, J.S., Somasundaram, Dagar, J; S., Jangra, S., Kumar, A.,	Zoology, Chemistry	Saudi Journal of Biological Sciences	2019	1319-562X	https://doi.org/10.1016/j.sjbs.2019.04.013	https://www.sciencedirect.com/science/article/pii/S1319562X19300066X	https://mjl.clarivate.com/search-results?issn=1319-562X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
182	**Techniques and tools for species identification in ciliates: A review.**	**Abraham, J.S.,** Sripoorna, S., Maurya, S., Makhija, S., Gupta, R., &	Zoology	International Journal of Systematic and Evolutionar	2019	1466-5026	https://doi.org/10.1099/ijsem.0.003176	https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijsem.0.0031	https://mjl.clarivate.com/search-results?issn=1466-5026&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

183	**Techniques and tools for species identification in ciliates: A review.**	Abraham, J.S., **Sripoorna, S.**, Maurya, S., Makhija, S., Gupta, R., &	Zoology	International Journal of Systematic and Evolutionar	2019	1466-5026	https://doi.org/10.1099/ijsem.0.003176	https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijsem.0.0031	https://mjl.clarivate.com/search-results?issn=1466-5026&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
184	**Techniques and tools for species identification in ciliates: A review.**	Abraham, J.S., Sripoorna, S.**, Maurya, S.,** Makhija, S., Gupta, R., &	Zoology	International Journal of Systematic and Evolutionar	2019	1466-5026	https://doi.org/10.1099/ijsem.0.003176	https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijsem.0.0031	https://mjl.clarivate.com/search-results?issn=1466-5026&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
185	**Techniques and tools for species identification in ciliates: A review.**	Abraham, J.S., Sripoorna, S., Maurya, S.**, Makhija, S.,** Gupta, R., &	Zoology	International Journal of Systematic and Evolutionar	2019	1466-5026	https://doi.org/10.1099/ijsem.0.003176	https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijsem.0.0031	https://mjl.clarivate.com/search-results?issn=1466-5026&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
186	**Techniques and tools for species identification in ciliates: A review.**	Abraham, J.S., Sripoorna, S., Maurya, S., Makhija, S., Gupta, R., &	Zoology	International Journal of Systematic and Evolutionar	2019	1466-5026	https://doi.org/10.1099/ijsem.0.003176	https://www.microbiologyresearch.org/content/journal/ijsem/10.1099/ijsem.0.0031	https://mjl.clarivate.com/search-results?issn=1466-5026&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
187	**Ferroelectric liquid crystal nanocomposites: Recent development and future perspective.**	**Yadav, S. P.**, Yadav, K., Lahiri, J. & Parmar, A. S.	Physics	Liquid Crystal Reviews	2019	2168-0418	https://doi.org/10.1080/21680396.2019.1589400	https://www.tandfonline.com/doi/full/10.1080/21680396.2019.1589400	https://mjl.clarivate.com/search-results?issn=2168-0396&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
188	**A Novel Method of Electrochemically Growing ZnO Nanorods on Graphene Oxide as Substrate for Gas Sensing Applications".**	Chetna, Kumar, S., **Garg, A.,** Chowdhuri, A., Jain, A. & Kapoor, A.	Physics, Electronics	Material Research Express	2019	2053 -1591	DOI 10.1088/2053-1591/ab16f8	https://iopscience.iop.org/article/10.1088/2053-1591/ab16f8#:~:text=The%20pote	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
189	**A Novel Method of Electrochemically Growing ZnO Nanorods on Graphene Oxide as Substrate for Gas Sensing Applications".**	Chetna, Kumar, S., **Garg, A.,** Chowdhuri, A., Jain, A. & Kapoor, A.	Physics, Electronics	Material Research Express	2019	2053 -1591	DOI 10.1088/2053-1591/ab16f8	https://iopscience.iop.org/article/10.1088/2053-1591/ab16f8#:~:text=The%20pote	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
190	**A Novel Method of Electrochemically Growing ZnO Nanorods on Graphene Oxide as Substrate for Gas Sensing Applications".**	Chetna, Kumar, S., Garg, A., **Chowdhuri, A.**, Jain, A. & Kapoor, A.	Physics, Electronics	Material Research Express	2019	2053 -1591	DOI 10.1088/2053-1591/ab16f8	https://iopscience.iop.org/article/10.1088/2053-1591/ab16f8#:~:text=The%20pote	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

191	**Transient setting of relativistic ponderomotive non-linearity and filamentation of ultra-short laser pulses in collisionless**	Sharma, R.P., Kumar, N., Uma, R., Singh, R.K., & **Gupta, P.K.**	Physics	Laser and Particle beams	2019	0263-0346	https://doi.org/10.1017/S0263034619000454	https://www.cambridge.org/core/journals/laser-and-particle-beams/article/ab	https://mjl.clarivate.com/search-results?issn=0263-0346&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
192	**Exploitation of potential bioactive compounds from two soil derived actinomycetes, Streptomyces sp. strain 196 and RI.24**	Kumar, P., Kundu, A., Kumar, M., Solanki, R., & **Kapur, M.K.**	Zoology	Microbiological Research	2019	0944-5013	https://doi.org/10.1016/j.micres.2019.126312	https://www.sciencedirect.com/science/article/pii/S0944501319304884?via%3Dihub	https://www.scopus.com/sourceid/20267	Indexed in UGC Care List, SCOPUS and Web of Science
193	**Exploitation of potential bioactive compounds from two soil derived actinomycetes, Streptomyces sp. strain 196 and RI.24**	Kumar, P., Kundu, A., **Kumar, M.**, Solanki, R., & Kapur, M.K.	Zoology	Microbiological Research	2019	0944-5013	https://doi.org/10.1016/j.micres.2019.126312	https://www.sciencedirect.com/science/article/pii/S0944501319304884?via%3Dihub	https://www.scopus.com/sourceid/20267	Indexed in UGC Care List, SCOPUS and Web of Science
194	**Exploitation of potential bioactive compounds from two soil derived actinomycetes, Streptomyces sp. strain 196 and RI.24**	**Kumar, P.**, Kundu, A., Kumar, M., Solanki, R., & Kapur, M.K.	Zoology	Microbiological Research	2019	0944-5013	https://doi.org/10.1016/j.micres.2019.126312	https://www.sciencedirect.com/science/article/pii/S0944501319304884?via%3Dihub	https://www.scopus.com/sourceid/20267	Indexed in UGC Care List, SCOPUS and Web of Science
195	**Expression and molecular characterizationof stress-responsive genes (hsp70 and Mn-sod) and evaluation of antioxidant enzymes (CAT**	Somasundaram, S., Abraham, J.S., Maurya, S., **Toteja, R.**, Gupta, R., &	Zoology	Molecular Biology Reports	2019	0301-4851	https://doi.org/10.1007/s11033-019-04942-0	https://link.springer.com/article/10.1007/s11033-019-04942-0	https://mjl.clarivate.com/search-results?issn=0301-4851&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
196	**Expression and molecular characterizationof stress-responsive genes (hsp70 and Mn-sod) and evaluation of antioxidant enzymes (CAT**	Somasundaram, S., Abraham, J.S., Maurya, S., Toteja, R., Gupta, R., &	Zoology	Molecular Biology Reports	2019	0301-4851	https://doi.org/10.1007/s11033-019-04942-0	https://link.springer.com/article/10.1007/s11033-019-04942-0	https://mjl.clarivate.com/search-results?issn=0301-4851&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
197	**Expression and molecular characterizationof stress-responsive genes (hsp70 and Mn-sod) and evaluation of antioxidant enzymes (CAT**	Somasundaram, S., Abraham, J.S., Maurya, S., Toteja, R., Gupta, R., &	Zoology	Molecular Biology Reports	2019	0301-4851	https://doi.org/10.1007/s11033-019-04942-0	https://link.springer.com/article/10.1007/s11033-019-04942-0	https://mjl.clarivate.com/search-results?issn=0301-4851&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
198	**Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018**	Kamra, K., Kaur, H., Abraham, J.S., Somasundaram, S., **Makhija, S.**,	Zoology	Journal of Eukaryotic Microbiology	2019	1066-5234	https://doi.org/10.1111/jeu.12773	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12773	https://mjl.clarivate.com/search-results?issn=1066-5234&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

199	**Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018**	Kamra, K., Kaur, H., Abraham, J.S., Somasundaram, S., **Makhija, S.**,	Zoology	Journal of Eukaryotic Microbiology	2019	1066-5234	https://doi.org/10.1111/jeu.12773	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12773	https://mjl.clarivate.com/search-results?issn=1066-5234&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
200	**Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018**	Kamra, K., Kaur, H., Abraham, J.S., Somasundaram, S., **Makhija, S.**,	Zoology	Journal of Eukaryotic Microbiology	2019	1066-5234	https://doi.org/10.1111/jeu.12773	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12773	https://mjl.clarivate.com/search-results?issn=1066-5234&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
201	**Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018**	Kamra, K., Kaur, H., Abraham, J.S., Somasundaram, S., Makhija, S.,	Zoology	Journal of Eukaryotic Microbiology	2019	1066-5234	https://doi.org/10.1111/jeu.12773	https://onlinelibrary.wiley.com/doi/10.1111/jeu.12773	https://mjl.clarivate.com/search-results?issn=1066-5234&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
202	**Synthesis, DFT studies, molecular docking, antimicrobial screening and UV fluorescence studies on ct-DNA for novel Schiff bases of**	Singhal, S., **Khanna, P** & Khanna, L.	Chemistry	Heliyon	2019	5-8440(On	https://doi.org/10.1016/j.heliyon.2019.e02596	https://www.sciencedirect.com/science/article/pii/S2405844019362565	https://www.scopus.com/sourceid/21100411756	Indexed in UGC Care List, SCOPUS and Web of Science
203	**Recent Trends in the Synthesis of Benzimidazoles From o-Phenylenediamine via Nanoparticles and Green Strategies Using Transition**	Singhal, S., **Khanna, P.,** Panda, S. S., & Khanna, L.	Chemistry	Journal Of Heterocyclic Chemistry	2019	3-5193 (On	https://doi.org/10.1002/jhet.3649	https://onlinelibrary.wiley.com/doi/abs/10.1002/jhet.3649	https://www.scopus.com/sourceid/25882	Indexed in UGC Care List, SCOPUS and Web of Science
204	**Curcumin based supramolecular ensemble for optical detection of Cu2+ and Hg2+ ions**	Lal, S., Prakash, K., Khera, N., Drashya, Singh, S., Singh, A., **Hooda, S.,** &	Chemistry	Journal of Molecular Structure	2019	0022-2860	https://doi.org/10.1016/j.molstruc.2020.128091	https://www.sciencedirect.com/science/article/abs/pii/S0022286020304166#:~:text=	https://www.scopus.com/sourceid/24642	Indexed in UGC Care List, SCOPUS and Web of Science
205	**Curcumin based supramolecular ensemble for optical detection of Cu2+ and Hg2+ ions**	Lal, S., Prakash, K., Khera, N., Drashya, Singh, S., Singh, A., **Hooda, S.,** &	Chemistry	Journal of Molecular Structure	2019	0022-2860	https://doi.org/10.1016/j.molstruc.2020.128091	https://www.sciencedirect.com/science/article/abs/pii/S0022286020304166#:~:text=	https://www.scopus.com/sourceid/24642	Indexed in UGC Care List, SCOPUS and Web of Science
206	**Curcumin based supramolecular ensemble for optical detection of Cu2+ and Hg2+ ions**	Lal, S., Prakash, K., Khera, N., Drashya, Singh, S., Singh, A., **Hooda, S.,** &	Chemistry	Journal of Molecular Structure	2019	0022-2860	https://doi.org/10.1016/j.molstruc.2020.128091	https://www.sciencedirect.com/science/article/abs/pii/S0022286020304166#:~:text=	https://www.scopus.com/sourceid/24642	Indexed in UGC Care List, SCOPUS and Web of Science

207	**Curcumin based supramolecular ensemble for optical detection of Cu2+ and Hg2+ ions**	Lal, S., Prakash, K., Khera, N., **Drashya, Singh**, S., Singh, A., Hooda, S., &	Chemistry	Journal of Molecular Structure	2019	0022-2860	https://doi.org/10.1016/j.molstruc.2020.128091	https://www.sciencedirect.com/science/article/abs/pii/S0022286020304166#:~:text=	https://www.scopus.com/sourceid/24642	Indexed in UGC Care List, SCOPUS and Web of Science
208	**Repurposing of FDA-approved drugs to target MurB and MurE enzymes in Mycobacterium tuberculosis, Journal of Biomolecular**	**Rani, J.**, Silla, Y., Borah, K., Ramachandran, S. & Bajpai, U.	Biomedical Science	Journal of Biomolecular Structure and Dynamics	2019	1102, 1538	https://doi.org/10.1080/07391102.2019.1637280	https://www.tandfonline.com/doi/abs/10.1080/07391102.2019.1637280	https://mjl.clarivate.com/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
209	**Repurposing of FDA-approved drugs to target MurB and MurE enzymes in Mycobacterium tuberculosis, Journal of Biomolecular**	Rani, J., Silla, Y., Borah, K., Ramachandran, S. & **Bajpai, U.**	Biomedical Science	Journal of Biomolecular Structure and Dynamics	2019	1102, 1538	https://doi.org/10.1080/07391102.2019.1637280	https://www.tandfonline.com/doi/abs/10.1080/07391102.2019.1637280	https://mjl.clarivate.com/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
210	**Polydopamine –aminoglycoside nanoconjugates: Synthesis, characterization, antimicrobial evaluation and**	Singh, I., Priyam, A., Jha, D., **Dhawan, G.**, Gautam, H. K., & Kumar, P.	Biomedical Science	MATERIALS SCIENCE & ENGINEERING C-MATERIALS	2019	0191 (Elect	https://doi.org/10.1016/j.msec.2019.110284	https://www.sciencedirect.com/science/article/pii/S0928493119318946	https://www.scopus.com/sourceid/17813	Indexed in SCOPUS
211	**Polydopamine –aminoglycoside nanoconjugates: Synthesis, characterization, antimicrobial evaluation and**	Singh, I., Priyam, A., Jha, D., **Dhawan, G.**, Gautam, H. K., & Kumar, P.	Biomedical Science	MATERIALS SCIENCE & ENGINEERING C-MATERIALS	2019	0191 (Elect	https://doi.org/10.1016/j.msec.2019.110284	https://www.sciencedirect.com/science/article/pii/S0928493119318946	https://www.scopus.com/sourceid/17813	Indexed in SCOPUS
212	**Identifying similar networks using structural hierarchy**	Saxena, R., **Kaur, S.**, & Bhatnagar, V.	Computer Science	Physica A: Statistical Mechanics and its Applications	2019	0378-4371	https://doi.org/10.1016/j.physa.2019.04.265	https://www.sciencedirect.com/science/article/abs/pii/S0378437119306399	https://mjl.clarivate.com/search-results?issn=0378-4371&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
213	**The Impact Of Various Digitized Social Networking Media Through Text, Images And Videos On Language Usage**	Mishra, S., **Samal, C.K.**, Yadav, N., & Choudhury, R.K.	Computer Science	INTERNATIONAL JOURNAL OF SCIENTIFIC	2019	2277-8616	http://www.ijstr.org/final-print/oct2019/The-	http://www.ijstr.org/final-print/oct2019/The-Impact-Of-Various-Digitized-	https://www.scopus.com/sourceid/21100894501	Indexed in SCOPUS
214	**Analysis of Al0.15Ga0.85N/GaN/Al0.15Ga0.85N DH-HEMT for RF and Microwave Frequency Applications**	Chugh, N., Kumar, M., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Semiconductors	2019	1063-7826	https://doi.org/10.1134/S1063782619130050	https://link.springer.com/article/10.1134/S1063782619130050	https://mjl.clarivate.com/search-results?issn=1063-7826&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

215	**PERTURBED SIX-BODY CONFIGURATION WITH VARIABLE MASS**	Ansari, A. A., **Meena, K. R.,** & Prasad, S. R.	Mathematics	Romanian Astronomical Journal	2019	1220-5168	http://www.astro.ro/~roaj/30_2/14-ansari-2015	http://www.astro.ro/~roaj/30_2/14-ansari-2015	https://mjl.clarivate.com/search-results?issn=1220-5168&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
216	**PERTURBED SIX-BODY CONFIGURATION WITH VARIABLE MASS**	Ansari, A. A., Meena, K. R**.,** & **Prasad, S. R.**	Mathematics	Romanian Astronomical Journal	2019	1220-5168	http://www.astro.ro/~roaj/30_2/14-ansari-2015	http://www.astro.ro/~roaj/30_2/14-ansari-2015	https://mjl.clarivate.com/search-results?issn=1220-5168&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
217	**Sheet carrier concentration and current–voltage analysis of Al0.15Ga0.85N/GaN/Al0.15Ga0.85N double**	Chugh, N., Kumar, M., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Microsystem Technologies	2019	9467076	https://doi.org/10.1007/s00542-019-04322-5	https://link.springer.com/article/10.1007/s00542-019-04322-5	nil	**PEER REVIEWED**
218	**Cytokine-induced expression of nitric oxide synthases in Chlamydia trachomatis-infected spontaneous aborters**	Prasad, P., **Singh, N.,** Das, B., Raisuddin, S., Dudeja, M., & Rastogi, S.	Biomedical Science	Journal of Maternal-Fetal and Neonatal Medicine	2019	1476-7058	: 10.1080/14767058.2018.1465914	https://pubmed.ncbi.nlm.nih.gov/29720007/	https://mjl.clarivate.com:/search-results?issn=1476-7058&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
219	**Does tumour necrosis factor alpha-induced cyclooxygenase-2 expression lead to spontaneous abortion in *Chlamydia trachomatis* -**	**Singh N**, Prasad P, Das B, Rastogi S	Biomedical Science	Microbial Pathogenesis	2019	0882-4010	https://doi.org/10.1016/j.micpath.2020.103994	https://www.sciencedirect.com/science/article/pii/S0882401019308915?via%3Dihub	https://www.scopus.com/sourceid/22941	**SCOPUS INDEXED**
220	**Hyperoxidation of Peroxiredoxin 6 Induces Alteration from Dimeric to Oligomeric State**	Shahnaj S, **Chowhan R K**, Potshangbam A M, Kakchingtabam	Biomedical Science	Antioxidants	2019	2076-3921	10.3390/antiox8020033.	https://pubmed.ncbi.nlm.nih.gov/30717364/	https://mjl.clarivate.com:/search-results?issn=2076-3921&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
221	**Prion protein transcription is auto-regulated through dynamic interactions with G-quadruplex motifs in its own promoter**	**Pradhan, P**, Srivastava A, Singh J, Biswas B, Saini A, Siddique I, ... &	Biomedical Science	Biochimica et Biophysica Acta (BBA)-Gene	2019	1876-4320	10.1016/j.bbagrm.2019.194479.	https://pubmed.ncbi.nlm.nih.gov/31931179/	https://mjl.clarivate.com:/search-results?issn=1874-9399&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
222	**A study of software reliability on big data open source software**	**Subhash Kumar** &	Physics	International Journal of System Assurance Engineering	2019	0976-4348	https://doi.org/10.1007/s13198-019-00777-x	https://link.springer.com/article/10.1007/s13198-019-00777-x	https://mjl.clarivate.com:/search-results?issn=0975-6809&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**

223	**A Case Study on R: a powerful OSS and data analysis platform**	Ranjan Kumar, **Subhash Kumar,** Sanjay K. Tiwary	Physics	International Journal of Applied Engineering Research	2019	0973-4562	https://www.ripublication.com/ijaer19/ijaerv14n9_31.pdf	https://www.ripublication.com/ijaer19/ijaerv14n9_31.pdf	nil	**PEER REVIEWED**
224	**Dynamics of a vertically vibrating mercury drop**	T Singla, **DK Verma**, JF Tovar, A Figueroa, F Vázquez, FB Yousif	Physics	AIP Advances	2019	2158-3226	https://doi.org/10.1063/1.5088043	https://pubs.aip.org/aip/adv/article/9/4/045204/1076422/Dynamics-of-a-vertically-	https://mjl.clarivate.com:/search-results?issn=2158-3226&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
225	**Fabrication and characterization of ZnO-TiO_2-PANI (ZTP) micro/nanoballs for the detection of flammable and toxic gases**	**Rakesh Kumar Sonker,** B.C. Yadav, Vinay Gupta, Monika Tomar	Physics	Journal of Hazardous Materials	2019	1873-3336	https://doi.org/10.1016/j.jhazmat.2018.10.016	https://www.sciencedirect.com/science/article/abs/pii/S0304389418309166	https://mjl.clarivate.com:/search-results?issn=0304-3894&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
226	**Investigation of thermodynamical, dielectric and electro-optical parameters of nematic liquid crystal doped with**	T. Vimal, K. Agrahari, **Rakesh Kumar Sonker**, R. Manohar	Physics	Journal of Molecular Liquids	2019	1873-3166	https://doi.org/10.1016/j.molliq.2019.111241	https://www.sciencedirect.com/science/article/abs/pii/S0167732219309481	https://mjl.clarivate.com:/search-results?issn=0167-7322&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
227	**Synthesis and characterization of highly porous hexagonal shaped CeO_2-Gd_2O_3-CoO nanocomposite and its opto-**	S. Sikarwar, B.C. Yadav, **Rakesh Kumar Sonker**, G.I. Dzhardimalieva,	Physics	Applied Surface Science	2019	1873-5584	https://doi.org/10.1016/j.apsusc.2019.02.108	https://www.sciencedirect.com/science/article/abs/pii/S0169433219304337	https://mjl.clarivate.com:/search-results?issn=0169-4332&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
228	**Entrainment of aperiodic and periodic oscillations in the Mercury Beating Heart system using external periodic forcing**	P Kumar, P Parmananda**, DK Verma,** T Singla, I de Nicolás, J Escalona	Physics	Chaos: An Interdisciplinary Journal of Nonlinear	2019	1054-1500	https://doi.org/10.1063/1.5083179	https://pubmed.ncbi.nlm.nih.gov/31154773/	nil	**PEER REVIEWED**
229	**Recyclable Organocatalysts for One-pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone**	Liu, M.; Zhang, X.; Huang, X.; **Dhawan, G.;** Evans, J.; Kaur, M.; Jasinski, J. P.;	Biomedical Science	Eur. J. Org. Chem	2019	1099-0690	https://doi.org/10.1002/ejoc.201801480	https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/ejoc.201801480#:~	https://mjl.clarivate.com:/search-results?issn=1434-193X&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
230	**Morphology of the Small Magellanic Cloud using multiwavelength photometry of classical Cepheids**	Sukanta Deb, Kerdaris Kurbah, Harinder P Singh, Shashi M Kanbur, Chow-	Physics	Monthly Notices of Royal Astronomical Society	2019	0035-8711	https://doi.org/10.1093/mnras/stz2328	https://academic.oup.com/mnras/article/489/3/3725/5553489	https://mjl.clarivate.com:/search-results?issn=0035-8711&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**

231	**Theoretical and experimental investigation on structural stability, electronic and vibrational properties of polvaniline (PANI)**	**Rakesh Kumar Sonker**, R. Shastri, B.C. Yadav	Physics	Proceedings of the Jangjeon Mathematical Society	2019	1598-7264	http://dx.doi.org/10.17777/pjms2019.22.1.129	https://www.dbpia.co.kr/Journal/articleDetail?nodeId=NODE10700506	nil	**PEER REVIEWED**
232	**Structural basis of peroxidase catalytic cycle of human Prdx6**	**Chowhan, R. K.**	Biomedical Science	Scientific reports	2020	2045-2322	https://doi.org/10.1038/s41598-020-74052-6	https://www.nature.com/articles/s41598-020-74052-6#:~:text=The%2	https://mjl.clarivate.com/search-results?issn=2045-2322&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
233	**Experimental validation of influenza A virus matrix protein (M1) interaction with host cellular alpha enolase and pyruvate kinase**	**Deepshikha**	Biomedical Science	Virology	2020	0042-6822	https://doi.org/10.1016/j.virol.2020.07.019	https://www.sciencedirect.com/science/article/pii/S0042682220301 46X?via%3Dihub	https://mjl.clarivate.com/search-results?issn=0042-6822&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
234	**Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films**	**Dhingra, V.,** Kumar, S., Kumar, R., Garg, A., & Chowdhuri, A.	Electronics and Physics	Materials Research Express	2020	2053-1591	DOI 10.1088/2053-1591/ab9ae7	https://iopscience.iop.org/article/10.1088/2053-1591/ab9ae7#:~:text=In%20the%2	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
235	**Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films**	Dhingra, V., Kumar, S., Kumar, R**., Garg, A**., & Chowdhuri, A.	Electronics and Physics	Materials Research Express	2020	2053-1591	DOI 10.1088/2053-1591/ab9ae7	https://iopscience.iop.org/article/10.1088/2053-1591/ab9ae7#:~:text=In%20the%2	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
236	**Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films**	Dhingra, V**.,** Kumar, S., Kumar, R**.,** Garg, A., & **Chowdhuri, A.**	Electronics and Physics	Materials Research Express	2020	2053-1591	DOI 10.1088/2053-1591/ab9ae7	https://iopscience.iop.org/article/10.1088/2053-1591/ab9ae7#:~:text=In%20the%2	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
237	**Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films**	Dhingra, V., **Kumar, S**., Kumar, R**.,** Garg, A., & Chowdhuri, A.	Electronics and Physics	Materials Research Express	2020	2053-1591	DOI 10.1088/2053-1591/ab9ae7	https://iopscience.iop.org/article/10.1088/2053-1591/ab9ae7#:~:text=In%20the%2	https://mjl.clarivate.com/search-results?issn=2053-1591&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
238	**Extraction of admittance parameters of symmetrically doped AlGaN/GaN/AlGaN DH-HEMT for microwave frequency applications.**	Chugh, N., Kumar, M., **Bhattacharya, M.,** & Gupta, R. S.	Electronics	Microsystem Technologies	2020	0946-7076	https://doi.org/10.1007/s00542-020-04805-w	https://link.springer.com/article/10.1007/s00542-020-04805-w	https://mjl.clarivate.com/search-results?issn=0946-7076&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS

239	**Synthesis of CdS nanoparticle by sol-gel method as low temperature NO_2 sensor**	**Sonker R.K.,** Yadav B.C., Gupta V., & Tomar M.	Physics	Materials Chemistry and Physics	2020	0254-0584	https://doi.org/10.1016/j.matchemphys.2019.121975	https://www.sciencedirect.com/science/article/abs/pii/S0254058419307746	https://mjl.clarivate.com/search-results?issn=0254-0584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
240	**Optimizing synthesis of Citrus limetta peel silver nanocomposites possessing larvicidal potential against dengue vector, Aedes**	Aggarwal, D., **Sharma, A.**, & Kumar, S.	Zoology	Advances in Zoology and Botany	2020	2331-5083	DOI: 10.13189/azb.2020.080103	https://www.hrpub.org/journals/article_info.php?aid=8630	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002048&flag=Search	Indexed in UGC Care List
241	**Optimizing synthesis of Citrus limetta peel silver nanocomposites possessing larvicidal potential against dengue vector, Aedes**	Aggarwal, D., Sharma, A., & **Kumar, S**.	Zoology	Advances in Zoology and Botany	2020	2331-5083	DOI: 10.13189/azb.2020.080103	https://www.hrpub.org/journals/article_info.php?aid=8630	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101002048&flag=Search	Indexed in UGC Care List
242	**One pot synthesis of silver nano-composites from Achyranthes aspera: An eco-friendly larvicide against Aedes aegypti L.**	**Sharma, A**., Tripathi, P., & Kumar, S.	Zoology	Asian Pacific Journal of Tropical Biomedicin	2020	2221-1691	10.4103/2221-1691.275420	https://journals.lww.com/aptb/fulltext/2020/10020/one_pot_synthesis_of_silver_nan	https://mjl.clarivate.com/search-results?issn=2221-1691&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
243	**One pot synthesis of silver nano-composites from Achyranthes aspera: An eco-friendly larvicide against Aedes aegypti L.**	Sharma, A., Tripathi, P., & **Kumar, S.**	Zoology	Asian Pacific Journal of Tropical Biomedicin	2020	2221-1691	DOI: 10.4103/2221-1691.275420	https://www.apjtb.org/article.asp?issn=2221-1691;year=2020;volume=10;issue	https://mjl.clarivate.com/search-results?issn=2221-1691&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
244	**Effect of dietary stress of emamectin benzoate on the Fitness Cost of American Bollworm, Helicoverpa armigera (Hübner, 1808).**	Dagar, V.S., **Mishra, M.**, & Kumar, S.	Zoology	International Journal of Tropical Insect Science	2020	7584 / 174	https://doi.org/10.1007/s42690-020-00168-x	https://link.springer.com/article/10.1007/s42690-020-00168-x	https://mjl.clarivate.com/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
245	**Effect of dietary stress of emamectin benzoate on the Fitness Cost of American Bollworm, Helicoverpa armigera (Hübner, 1808).**	Dagar, V.S., Mishra, M., & **Kumar, S.**	Zoology	International Journal of Tropical Insect Science	2020	7584 / 174	https://doi.org/10.1007/s42690-020-00168-x	https://link.springer.com/article/10.1007/s42690-020-00168-x	https://mjl.clarivate.com/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
246	**Effects of β-sitosterol on growth, development and midgut enzymes of Helicoverpa armigera Hübner.**	**Mishra, M.**, Sharma, A., Dagar, V.S., & Kumar, S.	Zoology	Archives of Biological Sciences	2020	4664 / 182	https://doi.org/10.2298/ABS200308021M	http://www.doiserbia.nb.rs/Article.aspx?ID=0354-46642000021M#.Y7P_8XZBzrc	https://mjl.clarivate.com/search-results?issn=0354-4664&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

247	**Effects of β-sitosterol on growth, development and midgut enzymes of Helicoverpa armigera Hübner.**	Mishra, M., **Sharma, A.**, Dagar, V.S., & Kumar, S.	Zoology	Archives of Biological Sciences	2020	4664 / 182	https://doi.org/10.2298/ABS200308021M	http://www.doiserbia.nb.rs/Article.aspx?ID=0354-46642000021M#.Y7P_8XZBzrc	https://mjl.clarivate.com/search-results?issn=0354-4664&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
248	**Effects of β-sitosterol on growth, development and midgut enzymes of Helicoverpa armigera Hübner.**	Mishra, M., Sharma, A., Dagar, V.S., & **Kumar, S.**	Zoology	Archives of Biological Sciences	2020	4664 / 182	https://doi.org/10.2298/ABS200308021M	http://www.doiserbia.nb.rs/Article.aspx?ID=0354-46642000021M#.Y7P_8XZBzrc	https://mjl.clarivate.com/search-results?issn=0354-4664&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
249	**Potential applications of extracellular enzymes from Streptomyces spp. in various industries**	Kumar, M., Kumar, P., **Das, P.**, Solanki, R., & Kapur, M.K**.**	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-01898-9	https://link.springer.com/article/10.1007/s00203-020-01898-9	https://www.scopus.com/sourceid/19623	Indexed in UGC Care List, SCOPUS and Web of Science
250	**Potential applications of extracellular enzymes from Streptomyces spp. in various industries**	Kumar, M., Kumar, P., Das, P., **Solanki, R.,** & Kapur, M.K.	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-01898-9	https://link.springer.com/article/10.1007/s00203-020-01898-9	https://www.scopus.com/sourceid/19623	Indexed in UGC Care List, SCOPUS and Web of Science
251	**Potential applications of extracellular enzymes from Streptomyces spp. in various industries**	Kumar, M., Kumar, P., Das, P., Solanki, R., & **Kapur, M.K.**	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-01898-9	https://link.springer.com/article/10.1007/s00203-020-01898-9	https://www.scopus.com/sourceid/19623	Indexed in UGC Care List, SCOPUS and Web of Science
252	**Description of a new species of Tetmemena (Ciliophora, Oxytrichidae) using classical and molecular markers**	Gupta, R., Abraham, J. S., **Sripoorna, S.**, Maurya, S., Toteja, R.,	Zoology	Journal of King Saud University-Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.03.009	https://www.sciencedirect.com/science/article/pii/S1018364720301026	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
253	**Description of a new species of Tetmemena (Ciliophora, Oxytrichidae) using classical and molecular markers**	Gupta, R., Abraham, J. S., Sripoorna, S., **Maurya, S.**, Toteja, R.,	Zoology	Journal of King Saud University-Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.03.009	https://www.sciencedirect.com/science/article/pii/S1018364720301026	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
254	**Description of a new species of Tetmemena (Ciliophora, Oxytrichidae) using classical and molecular markers**	Gupta, R., Abraham, J. S., Sripoorna, S., Maurya, S., **Toteja, R.**,	Zoology	Journal of King Saud University-Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.03.009	https://www.sciencedirect.com/science/article/pii/S1018364720301026	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS

255	**Description of a new species of Tetmemena (Ciliophora, Oxytrichidae) using classical and molecular markers**	Gupta, R., Abraham, J. S., Sripoorna, S., Maurya, S., **Toteja, R.**,	Zoology	Journal of King Saud University-Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.03.009	https://www.sciencedirect.com/science/article/pii/S1018364720301026	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
256	**Description of a new species of Tetmemena (Ciliophora, Oxytrichidae) using classical and molecular markers**	Gupta, R., Abraham, J. S., Sripoorna, S., Maurya, S., Toteja, R.,	Zoology	Journal of King Saud University-Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.03.009	https://www.sciencedirect.com/science/article/pii/S1018364720301026	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
257	**Spiro-Indole-Coumarin Hybrids: Synthesis, ADME, DFT, NBO Studies and In Silico Screening through Molecular Docking on DNA**	Khanna, L., Singhal, S., Jain, S. C., & **Khanna, P.**	Chemistry	ChemistrySelect	2020	5-6549 (On	https://doi.org/10.1002/slct.201904783	https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/slct.201904783	https://www.scopus.com/sourceid/21100850505	Indexed in UGC Care List, SCOPUS and Web of Science
258	**Biogenic Silver Nanoparticles: Evaluation of Their Biological and Catalytic Potential**	Sharma, B., Singh, I., Bajar, S., **Gupta, S.,** Gautam, H. & Kumar, P.	Chemistry	Indian Journal of Microbiology	2020	0046-8991	https://doi.org/10.1007/s12088-020-00889-0	https://link.springer.com/article/10.1007/s12088-020-00889-0	https://www.scopus.com/sourceid/19735	Indexed in UGC Care List, SCOPUS and Web of Science
259	**Ultrashort peptide self-assembly: Front-runners to transport drug and gene cargos.**	**Gupta, S.,** Singh, I., Sharma, A. K., & Kumar, P**.**	Chemistry	Frontiers in bioengineering and biotechnology	2020	2296-4185	https://doi.org/10.3389/fbioe.2020.00504	https://www.frontiersin.org/articles/10.3389/fbioe.2020.00504/full	https://www.scopus.com/sourceid/21100835954	Indexed in UGC Care List, SCOPUS and Web of Science
260	**Ultrashort peptide self-assembly: Front-runners to transport drug and gene cargos.**	**Gupta, S.,** Singh, I., Sharma, A. K., & Kumar, P**.**	Chemistry	Frontiers in bioengineering and biotechnology	2020	2296-4185	https://doi.org/10.3389/fbioe.2020.00504	https://www.frontiersin.org/articles/10.3389/fbioe.2020.00504/full	https://www.scopus.com/sourceid/21100835954	Indexed in UGC Care List, SCOPUS and Web of Science
261	**Adsorption of Rhodamine 6G dye on binary system of Nanoarchitectonics composite Magnetic Graphene Oxide Material**	Drashya, Lal, S., & Hooda, S.	Chemistry	Journal of Nanoscience and Nanotechnology	2020	1533-4880	https://doi.org/10.1166/jnn.2020.17442	https://www.ingentaconnect.com/content/asp/jnn/2020/00000020/00000005/art00	https://www.scopus.com/sourceid/28546	Indexed in SCOPUS
262	**Adsorption of Rhodamine 6G dye on binary system of Nanoarchitectonics composite Magnetic Graphene Oxide Material**	**Drashya**, Lal, S., & **Hooda, S.**	Chemistry	Journal of Nanoscience and Nanotechnology	2020	1533-4880	https://doi.org/10.1166/jnn.2020.17442	https://www.ingentaconnect.com/content/asp/jnn/2020/00000020/00000005/art00	https://www.scopus.com/sourceid/28546	Indexed in SCOPUS

263	**Magnetic Graphene Oxide/Chitin Nanocomposites for Efficient Adsorption of Methylene Blue and Crystal Violet from**	Gautam, D., & **Hooda, S.**	Chemistry	JOURNAL OF CHEMICAL AND ENGINEERI	2020	0021-9568	https://doi.org/10.1021/acs.jced.0c00350	https://pubs.acs.org/doi/10.1021/acs.jced.0c00350	https://www.scopus.com/sourceid/24158	Indexed in UGC Care List and Web of Science
264	**Magnetic Graphene Oxide/Chitin Nanocomposites for Efficient Adsorption of Methylene Blue and Crystal Violet from**	**Gautam, D.**, & Hooda, S.	Chemistry	JOURNAL OF CHEMICAL AND ENGINEERI	2020	0021-9568	https://doi.org/10.1021/acs.jced.0c00350	https://pubs.acs.org/doi/10.1021/acs.jced.0c00350	https://www.scopus.com/sourceid/24158	Indexed in UGC Care List and Web of Science
265	**Complexity Dynamics of Gumowski-Mira Map**	**Prasad S. N.,** Meena K. R., & Ansari A. A.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/06/15-	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
266	**Complexity Dynamics of Gumowski-Mira Map**	Prasad S. N**., Meena K. R.,** & Ansari A. A.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/06/15-	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
267	**Chaos Measure in autonomous LPA Model**	**Prasad S. N.,** Saha L. M., & Ansari A. A.	Mathematics	Gedrag En Organisatie review	2020	0921-5077	DOI:10.37896/GOR33.02/271	https://lemma-tijdschriften.com/gallery/goj-1864.pdf	https://mjl.clarivate.com/search-results?issn=0921-5077&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
268	**Supply chain model for expiring items following Ramp-type demand with stochastic lead time under crisp and fuzzy environment**	**Singh C.**, & Singh S. R.	Mathematics	International Journal of Fuzzy System Applications	2020	2156-177X	DOI: 10.4018/IJFSA.2020010103	https://www.igi-global.com/gateway/article/245271#pnlRecommendationForm	https://www.scopus.com/sourceid/21100301444	Indexed in UGC Care List and SCOPUS
269	**The anti-oxidant enzyme, Prdx6 might have cis-acting regulatory sequence(s).**	Shahnaj, S., Potshangbam, A.M., **Chowhan, R.K.**, Parray, Z.A.,	Biomedical Science	International Journal of Biological Macromolecules	2020	0003 (Elect	https://doi.org/10.1016/j.ijbiomac.2020.01.311	https://www.sciencedirect.com/science/article/abs/pii/S0141813019397971?via%3D	https://mjl.clarivate.com/search-results?issn=0141-8130&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
270	**Screening of Antitubercular Compound Library Identifies Inhibitors of Mur Enzymes in Mycobacterium tuberculosis**	Eniyan, K., Rani, J., Ramachandran, S., Bhat, R., Khan, I.A. &	Biomedical Science	SLAS DISCOVERY	2020	5560 (Elect	https://doi.org/10.1177/2472555219881148	https://slas-discovery.org/article/S2472-5552(22)06529-7/fulltext	https://mjl.clarivate.com/search-results?issn=2472-5552&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

271	**Screening of Antitubercular Compound Library Identifies Inhibitors of Mur Enzymes in Mycobacterium tuberculosis**	Eniyan, K., Rani, J., Ramachandran, S., Bhat, R., Khan, I.A. &	Biomedical Science	SLAS DISCOVERY	2020	5560 (Elect	https://doi.org/10.1177/2472555219881148	https://slas-discovery.org/article/S2472-5552(22)06529-7/fulltext	https://mjl.clarivate.com/search-results?issn=2472-5552&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
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273	**Characterization and genome analysis of B1 sub-cluster mycobacteriophage PDRPxv**	Sinha, A., Eniyan, K., Manohar, P., Ramesh, N., & **Bajpai, U.**	Biomedical Science	Virus research	2020	7492 (Elect	https://doi.org/10.1016/j.virusres.2020.197884Get rights and	https://www.sciencedirect.com/science/article/abs/pii/S0168170219307518	https://mjl.clarivate.com/search-results?issn=0168-1702&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
274	**Characterization and genome analysis of B1 sub-cluster mycobacteriophage PDRPxv**	Sinha, A., **Eniyan, K.**, Manohar, P., Ramesh, N., & Bajpai, U.	Biomedical Science	Virus research	2020	7492 (Elect	https://doi.org/10.1016/j.virusres.2020.197884Get rights and	https://www.sciencedirect.com/science/article/abs/pii/S0168170219307518	https://mjl.clarivate.com/search-results?issn=0168-1702&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
275	**Characterization and genome analysis of B1 sub-cluster mycobacteriophage PDRPxv**	Sinha, A., **Eniyan, K.**, Manohar, P., Ramesh, N., & Bajpai, U.	Biomedical Science	Virus research	2020	7492 (Elect	https://doi.org/10.1016/j.virusres.2020.197884Get rights and	https://www.sciencedirect.com/science/article/abs/pii/S0168170219307518	https://mjl.clarivate.com/search-results?issn=0168-1702&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
276	**Functional characterization of the endolysins derived from mycobacteriophage PDRPxv**	Eniyan, K., Sinha, A., Ahmad, S., & **Bajpai, U.**	Biomedical Science	World journal of microbiology & biotechnolo	2020	0972 (Elect	https://doi.org/10.1007/s11274-020-02858-7	https://link.springer.com/article/10.1007/s11274-020-02858-7	https://mjl.clarivate.com/search-results?issn=0959-3993&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
277	**Functional characterization of the endolysins derived from mycobacteriophage PDRPxv**	Eniyan, K., Sinha, A., Ahmad, S., & **Bajpai, U.**	Biomedical Science	World journal of microbiology & biotechnolo	2020	0972 (Elect	https://doi.org/10.1007/s11274-020-02858-7	https://link.springer.com/article/10.1007/s11274-020-02858-7	https://mjl.clarivate.com/search-results?issn=0959-3993&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
278	**Functional characterization of the endolysins derived from mycobacteriophage PDRPxv**	Eniyan, K., Sinha, A., Ahmad, S., & **Bajpai, U.**	Biomedical Science	World journal of microbiology & biotechnolo	2020	0972 (Elect	https://doi.org/10.1007/s11274-020-02858-7	https://link.springer.com/article/10.1007/s11274-020-02858-7	https://mjl.clarivate.com/search-results?issn=0959-3993&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS

279	**Functional characterization of the endolysins derived from mycobacteriophage PDRPxv**	**Eniyan, K.**, Sinha, A., Ahmad, S., & Bajpai, U.	Biomedical Science	World journal of microbiology & biotechnolo	2020	0972 (Elect	https://doi.org/10.1007/s11274-020-02858-7	https://link.springer.com/article/10.1007/s11274-020-02858-7	https://mjl.clarivate.com/search-results?issn=0959-3993&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
280	**Estimating Parameter of the Selected Uniform Population Under the Generalized Stein Loss Function**	**Meena K. R.,** & Gangopadhyay A. K.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/10_R1387_AA	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
281	**Reliable Path Finding Technique for Mobile Robot**	Choudhury, R. K., and **Samal, C.K.**	Computer Science	Journal of Computer Science and Technology	2020	9000 / 186	https://www.researchgate.net/profile/Chandrakanta-	https://www.researchgate.net/profile/Chandrakanta-Samal/publicatio	https://ugccare.unipune.ac.in/Apps1/User/WebA/ViewDetails?JournalId=101001966&flag=Search	Indexed in UGC Care List, SCOPUS and Web of Science
282	**Android-based application for shading analysis and assessment of actual solar energy potential**	**Garg, A.,** Sharma, P., Verma, V., & Kaur, T.	Electronics	New Concepts in Solar and Thermal Radiation	2020	0277-786X	https://doi.org/10.1117/12.2570966	https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11496/1149	https://www.scopus.com/sourceid/40067	Indexed in SCOPUS
283	**Android-based application for shading analysis and assessment of actual solar energy potential**	**Garg, A.,** Sharma, P., Verma, V., & Kaur, T.	Electronics	New Concepts in Solar and Thermal Radiation	2020	0277-786X	https://doi.org/10.1117/12.2570966	https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11496/1149	https://www.scopus.com/sourceid/40067	Indexed in SCOPUS
284	**Some fun pedagogical techniques to teach optics to students of all ages.**	**Garg, A.,** Sharma, P., Prajapat, P., Saxena, A., Pandey, P.,	Electronics	Optics Education and Outreach VI (Vol. 11480,	2020	0277-786X	https://doi.org/10.1117/12.2570964	https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11480/1148	https://www.scopus.com/sourceid/40067	Indexed in SCOPUS
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291	**Some fun pedagogical techniques to teach optics to students of all ages.**	**Garg, A.,** Sharma, P., Prajapat, P., Saxena, A., Pandey, P.,	Electronics	Optics Education and Outreach VI (Vol. 11480,	2020	0277-786X	https://doi.org/10.1117/12.2570964	https://www.spiedigitallibrary.org/conference-proceedings-of-spie/11480/1148	https://www.scopus.com/sourceid/40067	Indexed in SCOPUS
292	**Trace detection of Nerve agent simulant in the fuel vapor environment using metal oxide/Surface acoustic wave E-nose**	Kumar, J., Singh, H., **Raj, V. B.,** Nimal, A. T., Gupta, V. & Singh, V. K.	Physics	Defence Science Journal	2020	379X , 2456	DOI:10.14429/dsj.70.14584	https://core.ac.uk/download/pdf/335056862.pdf	https://www.scopus.com/sourceid/21100967064#tabs=1	Indexed in UGC Care List, SCOPUS and Web of Science
293	**Green synthesis of TiO2 nanosheet by chemical method for the removal of Rhodamine B from industrial waste**	**Sonker, R.K.,** Yadav, B.C., Gupta, V. & Tomar, M.	Physics	Materials Science And Engineering B: Solid-State	2020	0921-5107	https://doi.org/10.1016/j.mseb.2020.114577Get rights and	https://www.sciencedirect.com/science/article/abs/pii/S0921510720300842	https://mjl.clarivate.com/search-results?issn=0921-5107&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
294	**An overview of the factors affecting dengue transmission in Asian region and its predictive models.**	Samal, R.R., Gupta, S. & **Kumar, S.**	Zoology	Journal of Applied and Natural Science	2020	2231-5209	https://doi.org/10.31018/jans.v12i3.2360	https://journals.ansfoundation.org/index.php/jans/article/view/2360	https://www.scopus.com/sourceid/21101016916	Indexed in SCOPUS

295	**An overview of the factors affecting dengue transmission in Asian region and its predictive models.**	**Samal, R.R.**, Gupta, S. & Kumar, S.	Zoology	Journal of Applied and Natural Science	2020	2231-5209	https://doi.org/10.31018/jans.v12i3.2360	https://journals.ansfoundation.org/index.php/jans/article/view/2360	https://www.scopus.com/sourceid/21101016916	Indexed in SCOPUS
296	**Comparative larvicidal efficacy of α-cypermethrin alone and α-cypermethrin/Citrus sinensis peel extract binary mixtures**	Aggarwal, D, Samal, R. R. & **Kumar, S.**	Zoology	Romanian Journal of Biology-Zoology	2020	2248-3799	https://www.researchgate.net/profile/Roopa-Samal-	https://www.researchgate.net/profile/Roopa-Samal-2/publication/34	https://mjl.clarivate.com/search-results?issn=1843-7761&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
297	**Comparative larvicidal efficacy of α-cypermethrin alone and α-cypermethrin/Citrus sinensis peel extract binary mixtures**	Aggarwal, D, **Samal, R. R.** & Kumar, S.	Zoology	Romanian Journal of Biology-Zoology	2020	2248-3799	https://www.researchgate.net/profile/Roopa-Samal-	https://www.researchgate.net/profile/Roopa-Samal-2/publication/34	https://mjl.clarivate.com/search-results?issn=1843-7761&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
298	**Reduced physiological and reproductive fitness induced by Nerium oleander leaf extracts in the cotton bollworm, Helicoverpa**	Sivakumar, A., Mishra, M., Dagar, V. & **Kumar, S.**	Zoology	Acta Ecologica Sinica	2020	1872-2032	https://doi.org/10.1016/j.chnaes.2020.12.002	https://www.sciencedirect.com/science/article/abs/pii/S187220322030233X	https://mjl.clarivate.com/search-results?issn=1000-0933&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
299	**Reduced physiological and reproductive fitness induced by Nerium oleander leaf extracts in the cotton bollworm, Helicoverpa**	Sivakumar, A., Mishra, M., Dagar, V. & **Kumar, S.**	Zoology	Acta Ecologica Sinica	2020	1872-2032	https://doi.org/10.1016/j.chnaes.2020.12.002	https://www.sciencedirect.com/science/article/abs/pii/S187220322030233X	https://mjl.clarivate.com/search-results?issn=1000-0933&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
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301	**Protection of surplus food from fungal spoilage using Streptomyces spp.: a green approach**	Kumar, M., Kumar, P., Das, P., Solanki, R., & **Kapur, M.K.**	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-02087-4	https://link.springer.com/article/10.1007/s00203-020-02087-4	https://mjl.clarivate.com/search-results?issn=0302-8933&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
302	**Protection of surplus food from fungal spoilage using Streptomyces spp.: a green approach**	Kumar, M., Kumar, P., **Das, P.**, Solanki, R., & Kapur, M.K.	Zoology	Archives of Microbiology	2020	1432-072X	https://doi.org/10.1007/s00203-020-02087-4	https://link.springer.com/article/10.1007/s00203-020-02087-4	https://mjl.clarivate.com/search-results?issn=0302-8933&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

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304	**Draft genome and secondary metabolite biosynthetic gene clusters of Streptomyces sp. strain 196.**	Kumar, P., Chauhan, A., Kumar, M., Kuanr, B.K., Solanki, R., &	Zoology	Molecular Biology Reports	2020	1573-4978	https://doi.org/10.1007/s11033-020-05731-w	https://link.springer.com/article/10.1007/s11033-020-05731-w	https://mjl.clarivate.com/search-results?issn=0301-4851&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
305	**Indicators for assessment of soil quality: a mini-review**	Maurya, S., Abraham, J. S., Somasundaram, S., **Toteja, R.,** Gupta, R., &	Zoology	Environmental Monitoring and Assessment	2020	0167-6369	https://doi.org/10.1007/s10661-020-08556-z	https://link.springer.com/article/10.1007/s10661-020-08556-z	https://mjl.clarivate.com/search-results?issn=0167-6369&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
306	**Indicators for assessment of soil quality: a mini-review**	Maurya, S., Abraham, J. S., Somasundaram, S., Toteja, R., Gupta, R., &	Zoology	Environmental Monitoring and Assessment	2020	0167-6369	https://doi.org/10.1007/s10661-020-08556-z	https://link.springer.com/article/10.1007/s10661-020-08556-z	https://mjl.clarivate.com/search-results?issn=0167-6369&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
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309	**Ibuprofen-based chemosensor for efficient binding and sensing of Cu2+ ion in aqueous medium**	Lal, S., Prakash, K., Hooda, S.**, Kumar V.** & Kumar, P.	Chemistry	Journal of Molecular Structure	2020	0022-2860	https://doi.org/10.1016/j.molstruc.2019.127003	https://www.sciencedirect.com/science/article/abs/pii/S0022286019311032	https://mjl.clarivate.com/search-results?issn=0022-2860	Indexed in UGC Care List, SCOPUS and Web of Science
310	**Ibuprofen-based chemosensor for efficient binding and sensing of Cu2+ ion in aqueous medium**	Lal, S., Prakash, K., **Hooda, S.,** Kumar V. & Kumar, P.	Chemistry	Journal of Molecular Structure	2020	0022-2860	https://doi.org/10.1016/j.molstruc.2019.127003	https://www.sciencedirect.com/science/article/abs/pii/S0022286019311032	https://mjl.clarivate.com/search-results?issn=0022-2860	Indexed in UGC Care List, SCOPUS and Web of Science

311	**Ibuprofen-based chemosensor for efficient binding and sensing of Cu2+ ion in aqueous medium**	Lal, S., Prakash, K., **Hooda, S.,** Kumar V. & Kumar, P.	Chemistry	Journal of Molecular Structure	2020	0022-2860	https://doi.org/10.1016/j.molstruc.2019.127003	https://www.sciencedirect.com/science/article/abs/pii/S0022286019311032	https://mjl.clarivate.com/search-results?issn=0022-2860	Indexed in UGC Care List, SCOPUS and Web of Science
312	**Fabrication of a Gold-Supported NiAlTi-LayeredDouble Hydroxide Nanocatalyst for Organic Transformations**	Rathee, G., Kohli S., Panchal, S., Singh, N., Awasthi, A., Singh, S., Singh,	Chemistry	ACS OMEGA	2020	2470-1343	https://doi.org/10.1021/acsomega.0c03250	https://pubs.acs.org/doi/full/10.1021/acsomega.0c03250	https://mjl.clarivate.com/search-results?issn=2470-1343&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
313	**Fabrication of a Gold-Supported NiAlTi-LayeredDouble Hydroxide Nanocatalyst for Organic Transformations**	Rathee, G., Kohli S., Panchal, S., Singh, N., Awasthi, A., Singh, S., Singh,	Chemistry	ACS OMEGA	2020	2470-1343	https://doi.org/10.1021/acsomega.0c03250	https://pubs.acs.org/doi/full/10.1021/acsomega.0c03250	https://mjl.clarivate.com/search-results?issn=2470-1343&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
314	**Natural Polysaccharide Based Graphene Oxide Nanocomposites for Removal of Dyes from Wastewater: A Review**	Gautam, D., Saya, L., Malik, V., Singh, W. R., & **Hooda, S.**	Chemistry	Journal of Chemical & Engineering data	2020	9568 ,1520	https://doi.org/10.1021/acs.jced.0c00743	https://pubs.acs.org/doi/abs/10.1021/acs.jced.0c00743	https://mjl.clarivate.com/search-results?issn=0021-9568&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
315	**Natural Polysaccharide Based Graphene Oxide Nanocomposites for Removal of Dyes from Wastewater: A Review**	Gautam, D., Saya, L., Malik, V., Singh, W. R., & **Hooda, S.**	Chemistry	Journal of Chemical & Engineering data	2020	9568 ,1520	https://doi.org/10.1021/acs.jced.0c00743	https://pubs.acs.org/doi/abs/10.1021/acs.jced.0c00743	https://mjl.clarivate.com/search-results?issn=0021-9568&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
316	**Natural Polysaccharide Based Graphene Oxide Nanocomposites for Removal of Dyes from Wastewater: A Review**	**Gautam, D**., Saya, L., Malik, V., Singh, W. R., & Hooda, S.	Chemistry	Journal of Chemical & Engineering data	2020	0021-9568	https://doi.org/10.1021/acs.jced.0c00743	https://pubs.acs.org/doi/abs/10.1021/acs.jced.0c00743	https://mjl.clarivate.com/search-results?issn=0021-9568&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
317	**Self Nitrogen doped carbon Arogel drived from waste Cigarette buts (Cellulose acetate) for the adsorption of BPA : Kinetics and**	Norah S., Alhokbany Naushad, M., **Kumar, V.,** Hatim, S-Al, &	Chemistry	Journal of King Saud University Science	2020	1018-3647	https://doi.org/10.1016/j.jksus.2020.09.021	https://www.sciencedirect.com/science/article/pii/S1018364720302895	https://mjl.clarivate.com/search-results?issn=1018-3647&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
318	**Design and synthesis of various 5'-Deoxy-5'-(4-Substituted-1,2,3-Triazol-1-yl)-uridine analogues as inhibitors of Mycobacterium**	Hervin V., Arora R., Rani J., Ramchandran S**., Bajpai U.,** Agrofoglio L.A.,	Biomedical Science	Molecules	2020	1420-3049	https://doi.org/10.3390/molecules25214953	https://www.mdpi.com/1420-3049/25/21/4953	https://mjl.clarivate.com/search-results?issn=1420-3049&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

319	**Design and synthesis of various 5'-Deoxy-5'-(4-Substituted-1,2,3-Triazol-1-yl)-uridine analogues as inhibitors of Mycobacterium**	Hervin V., Arora R., Rani J., Ramchandran S., **Bajpai U.,** Agrofoglio L.A.,	Biomedical Science	Molecules	2020	1420-3049	https://doi.org/10.3390/molecules25214953	https://www.mdpi.com/1420-3049/25/21/4953	https://mjl.clarivate.com/search-results?issn=1420-3049&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
320	**Design and synthesis of various 5'-Deoxy-5'-(4-Substituted-1,2,3-Triazol-1-yl)-uridine analogues as inhibitors of Mycobacterium**	Hervin V., Arora R., Rani J., Ramchandran S., **Bajpai U.,** Agrofoglio L.A.,	Biomedical Science	Molecules	2020	1420-3049	https://doi.org/10.3390/molecules25214953	https://www.mdpi.com/1420-3049/25/21/4953	https://mjl.clarivate.com/search-results?issn=1420-3049&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
321	**Neem flowers (Azadirachta indica) as an abundant source of nectar for butterflies in an urban landscape in Delhi, India**	**Chaudhary, R.**	Biomedical Science	Bionotes	2020	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
322	**A comprehensive checklist of butterflies seen in Corbett Tiger Reserve, Uttarakhand, India**	**Chaudhary, R.,** Chhimwal, S., & Kumar, V.	Biomedical Science	Bionotes	2020	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
323	**Oviposition by Jamides bochus (Stoll, [1782]) (Insecta: Lepidoptera: Lycaenidae) in New Delhi, India**	**Chaudhary, R.** & Kumar, V.	Biomedical Science	Bionotes	2020	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
324	**Diabetes: Perspective and challenges in modern era.**	Goel, Y., Verma, A.K., Bhatt, D., Rahmani, A.H., **Yasheshwar**, & Dev K.	Botany	Gene Reports	2020	2452-0144	https://doi.org/10.1016/j.genrep.2020.100759	https://www.sciencedirect.com/science/article/pii/S2452014420301734#:~:text=Prev	https://mjl.clarivate.com/search-results?issn=2452-0144&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
325	**Vertical Motion of the Variable Infinitesimal Mass in the Cicular Sitnikov Problem**	Ansari, A.A., **Prasad, S.N.** & Singh, C.	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/41_R1397_AA	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
326	**Vertical Motion of the Variable Infinitesimal Mass in the Cicular Sitnikov Problem**	Ansari, A.A., Prasad, S.N. & **Singh, C.**	Mathematics	Application and Applied mathematics	2020	1932-9466	https://www.pvamu.edu/aam/wp-content/uploads/sites/1	https://www.pvamu.edu/aam/wp-content/uploads/sites/182/2020/12/41_R1397_AA	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science

327	**Generalized Elliptic Restricted Four-Body Problem with Variable Mass**	**Prasad, S. N.** & Ansari, A. A.	Mathematics	Astronomy Letters	2020	1063-7737	https://doi.org/10.1134/S1063773720040015	https://link.springer.com/article/10.1134/S1063773720040015	https://mjl.clarivate.com/search-results?issn=1063-7737&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
328	**The Motion Properties of the Variable Mass Planetoid in the Elliptical Sitnikov Problem**	Ansari, A.A., **Narain, L.** & Prasad, S.N.	Mathematics	Gedrag En Organisatie review	2020	0921-5077	DOI:10.37896/GOR33.03/436	https://drive.google.com/file/d/1IbtP1neYawuT8nEaSv8JogFZeTIHrgZ_/view	https://mjl.clarivate.com/search-results?issn=0921-5077&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
329	**The Motion Properties of the Variable Mass Planetoid in the Elliptical Sitnikov Problem**	Ansari, A.A., Narain, L**.** & **Prasad, S.N.**	Mathematics	Gedrag En Organisatie review	2020	0921-5077	DOI:10.37896/GOR33.03/436	https://drive.google.com/file/d/1IbtP1neYawuT8nEaSv8JogFZeTIHrgZ_/view	https://mjl.clarivate.com/search-results?issn=0921-5077&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
330	**EPQ MODEL WITH GREEN PRODUCTION, PRODUCT STEWARD SHIP AND SELLING PRICE DEPENDENT DEMAND**	Saxena, P., **Singh, C.** & Sharma, K.	Mathematics	INTERNATIONAL JOURNAL OF AGRICULTU	2020	0973-1903	DOI: 10.1007/978-981-10-5687-1_10	https://link.springer.com/chapter/10.1007/978-981-10-5687-1_10	https://mjl.clarivate.com/search-results?issn=0973-1903&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
331	**Green design and product stewardship approach for two-warehouse inventory model**	Saxena, P., **Singh, C.** & Sharma, K.	Mathematics	Indian Journal of Science and Technology	2020	0974-6846	10.17485/IJST/v13i37.290	https://indjst.org/articles/green-design-and-product-stewardship-	https://mjl.clarivate.com/search-results?issn=0974-6846&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
332	**Generalized cr3b problem with heterogeneous primary and secondary as finite straight segment**	Ansari, A.A., **Meena, K. R.** & K. Shalini	Mathematics	Application and Applied mathematics	2020	1932-9466	https://digitalcommons.pvamu.edu/cgi/viewcontent.cgi?articl	https://digitalcommons.pvamu.edu/cgi/viewcontent.cgi?article=1918&context=aam	https://mjl.clarivate.com/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
333	**A comprehensive review on potential therapeutics interventions for COVID-19.**	Chugh, H., Awasthi, A., Agarwal, Y., Gaur, R. K., **Dhawan, G.**, &	Biomedical Science	European journal of pharmacology	2020	1879-0712	https://doi.org/10.1016/j.ejphar.2020.173741	https://www.sciencedirect.com/science/article/pii/S0014299920308335	https://mjl.clarivate.com:/search-results?issn=0014-2999&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
334	**Fe3 O4 loaded chitin–A promising nano adsorbent for Reactive Blue 13 dye.**	Gautam, D., Saya, L., & **Hooda, S.**	Chemistry	Environmental Advances	2020	2666-7657	https://doi.org/10.1016/j.envadv.2020.100014	https://www.sciencedirect.com/science/article/pii/S2666765720300144?via%3Dihub	https://www.scopus.com/sourceid/21101065035	**SCOPUS INDEXED**

335	**Fe3 O4 loaded chitin–A promising nano adsorbent for Reactive Blue 13 dye.**	Gautam, D., Saya, L., & **Hooda, S.**	Chemistry	Environmental Advances	2020	2666-7657	https://doi.org/10.1016/j.envadv.2020.100014	https://www.sciencedirect.com/science/article/pii/S2666765720300144?via%3Dihub	https://www.scopus.com/sourceid/21101065035	**SCOPUS INDEXED**
336	**Fe3 O4 loaded chitin–A promising nano adsorbent for Reactive Blue 13 dye.**	Gautam, D., Saya, L., & **Hooda, S.**	Chemistry	Environmental Advances	2020	2666-7657	https://doi.org/10.1016/j.envadv.2020.100014	https://www.sciencedirect.com/science/article/pii/S2666765720300144?via%3Dihub	https://www.scopus.com/sourceid/21101065035	**SCOPUS INDEXED**
337	**Synthesis of Silver Nanoparticles by Phyllanthus emblica Plant Extract and Their Antibacterial Activity**	Meena, R. K., Meena, R., **Arya, D. K.**, Jadoun, S., Hada, R., & Kumari, R.	Chemistry	Material Science Research India	2020	0973-3469	http://dx.doi.org/10.13005/msri/170206	http://www.materialsciencejournal.org/vol17no2/synthesis-of-silver-	nil	**PEER REVIEWED**
338	**Artificial Intelligence Assisted Smart Mirror**	**Garg, A.,** Sharma, P., Verma, V., Yadav, S., & Tyagi, A.	Electronics	International Journal of Scientific and Technical	2020	2454-1532	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	nil	**PEER REVIEWED**
339	**Artificial Intelligence Assisted Smart Mirror**	**Garg, A.,** Sharma, P., Verma, V., Yadav, S., & Tyagi, A.	Electronics	International Journal of Scientific and Technical	2020	2454-1532	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	nil	**PEER REVIEWED**
340	**Artificial Intelligence Assisted Smart Mirror**	**Garg, A.,** Sharma, P., Verma, V., Yadav, S., & Tyagi, A.	Electronics	International Journal of Scientific and Technical	2020	2454-1532	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	nil	**PEER REVIEWED**
341	**Artificial Intelligence Assisted Smart Mirror**	**Garg, A.,** Sharma, P., Verma, V., Yadav, S., & Tyagi, A.	Electronics	International Journal of Scientific and Technical	2020	2454-1532	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	nil	**PEER REVIEWED**
342	**Artificial Intelligence Assisted Smart Mirror**	**Garg, A.,** Sharma, P., Verma, V., Yadav, S., & Tyagi, A.	Electronics	International Journal of Scientific and Technical	2020	2454-1532	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20	https://www.ijsta.com/papers/IJSTAV6N4Y20/IJSTAV6N4Y20_2021.pdf	nil	**PEER REVIEWED**

343	**Enhancement in NH3 sensing performance of ZnO thin-film via gamma-irradiation.**	Waikar, M. R., Raste, P. M., **Sonker, R. K.**, Gupta, V., Tomar, M.,	Physics	Journal of Alloys and Compounds	2020	1873-4669	https://doi.org/10.1016/j.jallcom.2020.154641	https://www.sciencedirect.com/science/article/abs/pii/S0925838820310045?via%3D	https://www.scopus.com/sourceid/12325	**SCOPUS INDEXED**
344	**Post-γ-irradiation effects on structural, optical and morphological properties of chemical vapour deposited MWCNTs.**	Waikar, M. R., **Sonker, R. K.**, Gupta, S., Chakarvarti, S. K., &	Physics	Materials Science in Semiconductor Processing	2020	1873-4081	https://doi.org/10.1016/j.mssp.2020.104975	https://www.sciencedirect.com/science/article/abs/pii/S1369800119323443?via%3D	https://mjl.clarivate.com:/search-results?issn=1369-8001&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
345	**Chemistry and Pharmacology of Miraculous, Echinacea purpurea L.**	**Arya, D. K**	Chemistry	Journal of Biological and Chemical Research	2020	0970-4973	https://www.jbcr.co.in/Current_Issue/Vol_37_1_Jan_Jun_202	https://www.jbcr.co.in/Current_Issue/Vol_37_1_Jan_Jun_2020/21.%20Echnesea%20P	nil	**PEER REVIEWED**
346	**Chemical Research, 37, 180-187, ISSN 0970-4973.**	Aggarwal D, Sharma A, **Kumar, S.** (2020)	Zoology	Advances in Zoology and Botany	2020		10.13189/azb.2020.080103	https://www.hrpub.org/download/20191230/AZB3-11414236.pdf	nil	**PEER REVIEWED**
347	**pH induced conformational alteration in human peroxiredoxin 6 might be responsible for its resistance against lysosomal pH or high**	**Chowhan, R. K.**	Biomedical Science	Scientific reports	2021	2045-2322	https://doi.org/10.1038/s41598-021-89093-8	https://www.nature.com/articles/s41598-021-89093-8	https://mjl.clarivate.com/search-results?issn=2045-2322&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
348	**Exploiting Emojis in Sentiment Analysis : A Survey**	**Grover, V.**	Computer Science	Journal of The Institution of Engineers	2021	2250-2114	CARE Listed Journal,Sl.No.10	https://link.springer.com/article/10.1007/s40031-021-00620-7	https://www.scopus.com/sourceid/21100831436	Indexed in UGC Care List and SCOPUS.
349	**Optimisation of dielectric spacer layer thickness in Ag nanospheres/ITO/c-Si structure for plasmonic solar cells using FDTD simulation.**	Rani, M., Kashyap, J., **Singh, U.**, & Kapoor, A.	Electronics	Materials Technology	2021	7857, 1753	https://doi.org/10.1080/10667857.2021.1940046	https://www.tandfonline.com/doi/abs/10.1080/10667857.2021.1940046	https://mjl.clarivate.com/search-results?issn=1066-7857&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
350	**Optimisation of dielectric spacer layer thickness in Ag nanospheres/ITO/c-Si structure for plasmonic solar cells using FDTD simulation.**	**Rani, M.**, Kashyap, J., Singh, U., & Kapoor, A.	Electronics	Materials Technology	2021	7857, 1753	https://doi.org/10.1080/10667857.2021.1940046	https://www.tandfonline.com/doi/abs/10.1080/10667857.2021.1940046	https://mjl.clarivate.com/search-results?issn=1066-7857&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

351	**Applicability of Field Plate in Double Channel GaN HEMT for Radio-Frequency and Power-Electronic Applications.**	Chugh, N., Kumar, M., Haldar, S., **Bhattacharya, M.,** & Gupta, R.	Electronics	Silicon	2021	1876-990X	https://doi.org/10.1007/s12633-020-00881-9	https://link.springer.com/article/10.1007/s12633-020-00881-9	https://mjl.clarivate.com/search-results?issn=1876-990X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
352	**Gamma Rays Induced Modification in Ultrahigh Molecular Weight Polyethylene (UHMWPE)**	Aarya, S., **Kumar, P.,** Bhatia, M., Kumar, S. Sharma, J. &	Physics	Advances in Polymer Technology	2021	0730-6679	https://doi.org/10.1155/2021/7013154	https://www.hindawi.com/journals/apt/2021/7013154/	https://mjl.clarivate.com/search-results?issn=0730-6679&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
353	**Gamma Rays Induced Modification in Ultrahigh Molecular Weight Polyethylene (UHMWPE)**	Aarya, S., Kumar, P**., Bhatia, M.,** Kumar, S. Sharma, J. & Siddhartha	Physics	Advances in Polymer Technology	2021	0730-6679	https://doi.org/10.1155/2021/7013154	https://www.hindawi.com/journals/apt/2021/7013154/	https://mjl.clarivate.com/search-results?issn=0730-6679&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
354	**Gamma Rays Induced Modification in Ultrahigh Molecular Weight Polyethylene (UHMWPE)**	Aarya, S., Kumar, P., Bhatia, M., Kumar, S. Sharma, J. & **Siddhartha**	Physics	Advances in Polymer Technology	2021	0730-6679	https://doi.org/10.1155/2021/7013154	https://www.hindawi.com/journals/apt/2021/7013154/	https://mjl.clarivate.com/search-results?issn=0730-6679&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
355	**Superficial Synthesis of CdS Quantum Dots for an Efficient Perovskite-Sensitized Solar Cell**	**Sonker, R. K.,** Shastri, R. & Johari, R.	Physics	Energy & Fuels	2021	0887-0624	https://doi.org/10.1021/acs.energyfuels.1c00629	https://pubs.acs.org/doi/abs/10.1021/acs.energyfuels.1c00629	https://mjl.clarivate.com/search-results?issn=0887-0624&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
356	**Influence of lufenuron on the nutrient content and detoxification enzyme expression in Aedes aegypti L. (Diptera: Culicidae)**	Kungreiliu, P., Samal, R.R., Lanbiliu, P. & **Kumar, S.**	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-021-00481-z	https://link.springer.com/article/10.1007/s42690-021-00481-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
357	**Influence of lufenuron on the nutrient content and detoxification enzyme expression in Aedes aegypti L. (Diptera: Culicidae)**	Kungreiliu, P., Samal, R.R**., Lanbiliu, P.** & **Kumar, S.**	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-021-00481-z	https://link.springer.com/article/10.1007/s42690-021-00481-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
358	**Influence of lufenuron on the nutrient content and detoxification enzyme expression in Aedes aegypti L. (Diptera: Culicidae)**	Kungreiliu, P., **Samal, R.R.**, Lanbiliu, P. & Kumar, S.	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-021-00481-z	https://link.springer.com/article/10.1007/s42690-021-00481-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

359	**Cuticular thickness associated with insecticide resistance in Aedes aegypti**	**Samal, R.R**. & Kumar, S.	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-020-00271-z	https://link.springer.com/article/10.1007/s42690-020-00271-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
360	**Cuticular thickness associated with insecticide resistance in Aedes aegypti**	Samal, R.R. & **Kumar, S.**	Zoology	International Journal of Tropical Insect Science	2021	1742-7592	https://doi.org/10.1007/s42690-020-00271-z	https://link.springer.com/article/10.1007/s42690-020-00271-z	https://mjl.clarivate.com:/search-results?issn=1742-7584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
361	**Physiological and reproductive fitness cost in Aedes aegypti on exposure to toxic xenobiotics in New Delhi, India**	Gupta, A., **Samal, R.R**. & Kumar, S.	Zoology	Journal of Applied and Natural Science	2021	2231-5209	https://doi.org/10.31018/jans.v13i1.2470	https://journals.ansfoundation.org/index.php/jans/article/view/2470	https://www.scopus.com/sourceid/21101016916	Indexed in SCOPUS
362	**Physiological and reproductive fitness cost in Aedes aegypti on exposure to toxic xenobiotics in New Delhi, India**	Gupta, A., Samal, R.R. & **Kumar, S.**	Zoology	Journal of Applied and Natural Science	2021	2231-5209	https://doi.org/10.31018/jans.v13i1.2470	https://journals.ansfoundation.org/index.php/jans/article/view/2470	https://www.scopus.com/sourceid/21101016916	Indexed in SCOPUS
363	**Proactive role of Streptomyces spp. in plant growth stimulation and management of chemical pesticides and fertilizers**	Kumar, M., Kumar, P., **Das, P**., Solanki, R., & Kapur, M.K**.**	Zoology	International Journal of Environmental Science and	2021	1735-2630	https://doi.org/10.1007/s13762-021-03473-1	https://link.springer.com/article/10.1007/s13762-021-03473-1	https://www.scopus.com/sourceid/40001485503	Indexed in SCOPUS
364	**Proactive role of Streptomyces spp. in plant growth stimulation and management of chemical pesticides and fertilizers**	Kumar, M., Kumar, P., Das, P., **Solanki, R.**, & Kapur, M.K.	Zoology	International Journal of Environmental Science and	2021	1735-2630	https://doi.org/10.1007/s13762-021-03473-1	https://link.springer.com/article/10.1007/s13762-021-03473-1	https://www.scopus.com/sourceid/40001485503	Indexed in SCOPUS
365	**Proactive role of Streptomyces spp. in plant growth stimulation and management of chemical pesticides and fertilizers**	Kumar, M., Kumar, P., Das, P., Solanki, R., & **Kapur, M.K.**	Zoology	International Journal of Environmental Science and	2021	1735-2630	https://doi.org/10.1007/s13762-021-03473-1	https://link.springer.com/article/10.1007/s13762-021-03473-1	https://www.scopus.com/sourceid/40001485503	Indexed in SCOPUS
366	**Proactive role of Streptomyces spp. in plant growth stimulation and management of chemical pesticides and fertilizers**	Kumar, M., Kumar, P., Das, P., Solanki, R., & **Kapur, M.K.**	Zoology	International Journal of Environmental Science and	2021	1735-2630	https://doi.org/10.1007/s13762-021-03473-1	https://link.springer.com/article/10.1007/s13762-021-03473-1	https://www.scopus.com/sourceid/40001485503	Indexed in SCOPUS

367	**Exploring Small Heat Shock Proteins (sHSPs) for Targeting Drug Resistance in Candida albicans and other Pathogenic Fungi.**	**Dev, R.**	Zoology	Journal of Pure and Applied Microbiology	2021	0973-7510	https://doi.org/10.22207/JPAM.15.1.42	https://pdfs.semanticscholar.org/f40d/33f7d5878e6410b4b23f2f4e53efcaf5b336.pdf	https://www.scopus.com/sourceid/11700154322	Indexed in SCOPUS
368	**Characterization of Euplotes lynni nov. spec., E. indica nov. spec. and description of E. aediculatus and E. woodruffi (Ciliophora,**	Abraham, J. S., Somasundaram, S., Maurya, S., Gupta, R., **Makhija, S.,** &	Zoology	European Journal of Protistology	2021	0932-4739	https://doi.org/10.1016/j.ejop.2021.125779	https://www.sciencedirect.com/science/article/abs/pii/S0932473921000146	https://mjl.clarivate.com/search-results?issn=0932-4739&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
369	**Characterization of Euplotes lynni nov. spec., E. indica nov. spec. and description of E. aediculatus and E. woodruffi (Ciliophora,**	Abraham, J. S., Somasundaram, S., Maurya, S., Gupta, R., **Makhija, S.,** &	Zoology	European Journal of Protistology	2021	0932-4739	https://doi.org/10.1016/j.ejop.2021.125779	https://www.sciencedirect.com/science/article/abs/pii/S0932473921000146	https://mjl.clarivate.com/search-results?issn=0932-4739&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
370	**Characterization of Euplotes lynni nov. spec., E. indica nov. spec. and description of E. aediculatus and E. woodruffi (Ciliophora,**	Abraham, J. S., Somasundaram, S., Maurya, S., Gupta, R., **Makhija, S.,** &	Zoology	European Journal of Protistology	2021	0932-4739	https://doi.org/10.1016/j.ejop.2021.125779	https://www.sciencedirect.com/science/article/abs/pii/S0932473921000146	https://mjl.clarivate.com/search-results?issn=0932-4739&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
371	**Characterization of Euplotes lynni nov. spec., E. indica nov. spec. and description of E. aediculatus and E. woodruffi (Ciliophora,**	Abraham, J. S., Somasundaram, S., Maurya, S., Gupta, R., **Makhija, S.,** &	Zoology	European Journal of Protistology	2021	0932-4739	https://doi.org/10.1016/j.ejop.2021.125779	https://www.sciencedirect.com/science/article/abs/pii/S0932473921000146	https://mjl.clarivate.com/search-results?issn=0932-4739&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
372	**Characterization of Euplotes lynni nov. spec., E. indica nov. spec. and description of E. aediculatus and E. woodruffi (Ciliophora,**	Abraham, J. S., Somasundaram, S., Maurya, S., Gupta, R., Makhija, S.**,** &	Zoology	European Journal of Protistology	2021	0932-4739	https://doi.org/10.1016/j.ejop.2021.125779	https://www.sciencedirect.com/science/article/abs/pii/S0932473921000146	https://mjl.clarivate.com/search-results?issn=0932-4739&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
373	**Guar gum based nanocomposites: Role in water purification through efficient removal of dyes and metal ions**	Saya, L., Malik, V., Singh, A., Singh, S., **Gambhir, G.**, Singh, W.R.,	Chemistry	Carbohydrate Polymers	2021	3617 / 187	https://doi.org/10.1016/j.carbpol.2021.117851	https://www.sciencedirect.com/science/article/abs/pii/S0144861721002381	https://mjl.clarivate.com:/search-results?issn=0144-8617&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
374	**Guar gum based nanocomposites: Role in water purification through efficient removal of dyes and metal ions**	Saya, L., Malik, V., Singh, A., Singh, S., Gambhir, G., Singh, W.R.,	Chemistry	Carbohydrate Polymers	2021	3617 / 187	https://doi.org/10.1016/j.carbpol.2021.117851	https://www.sciencedirect.com/science/article/abs/pii/S0144861721002381	https://mjl.clarivate.com:/search-results?issn=0144-8617&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

375	**Guar gum based nanocomposites: Role in water purification through efficient removal of dyes and metal ions**	Saya, L., Malik, V., Singh, A., Singh, S., Gambhir, G., Singh, W.R.,	Chemistry	Carbohydrate Polymers	2021	3617 / 187	https://doi.org/10.1016/j.carbpol.2021.117851	https://www.sciencedirect.com/science/article/abs/pii/S0144861721002381	https://mjl.clarivate.com:/search-results?issn=0144-8617&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
376	**Recent advances in a polydopamine mediated Antimicrobial Adhesion system**	Singh, I., **Dhawan, G.**, Gupta, S. & Kumar, P.	Biomedical Sciences & Chemistry	Frontiers in Microbiology	2021	1664302X	https://doi.org/10.3389/fmicb.2020.607099	https://www.frontiersin.org/articles/10.3389/fmicb.2020.607099/full	https://mjl.clarivate.com/search-results?issn=1664-302X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
377	**Recent advances in a polydopamine mediated Antimicrobial Adhesion system**	Singh, I., Dhawan, G., **Gupta, S.** & Kumar, P.	Biomedical Sciences & Chemistry	Frontiers in Microbiology	2021	1664302X	https://doi.org/10.3389/fmicb.2020.607099	https://www.frontiersin.org/articles/10.3389/fmicb.2020.607099/full	https://mjl.clarivate.com/search-results?issn=1664-302X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
378	**Antimicrobial, radical scavenging and dye degradation potential of nontoxic biogenic silver nanoparticles using Cassia**	Singh, I., **Gupta, S.**, Gautam, H.K., Kumar, P. & Dhawan, G**.**	Chemistry & Biomedical Sciences	Chemical Papers	2021	7290, 0366	https://doi.org/10.1007/s11696-020-01355-3	https://link.springer.com/article/10.1007/s11696-020-01355-3	https://mjl.clarivate.com/search-results?issn=0366-6352&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
379	**Antimicrobial, radical scavenging and dye degradation potential of nontoxic biogenic silver nanoparticles using Cassia**	Singh, I., **Gupta, S.**, Gautam, H.K., Kumar, P. & Dhawan, G**.**	Chemistry & Biomedical Sciences	Chemical Papers	2021	7290, 0366	https://doi.org/10.1007/s11696-020-01355-3	https://link.springer.com/article/10.1007/s11696-020-01355-3	https://mjl.clarivate.com/search-results?issn=0366-6352&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
380	**Antimicrobial, radical scavenging and dye degradation potential of nontoxic biogenic silver nanoparticles using Cassia**	Singh, I., Gupta, S., Gautam, H.K., Kumar, P. & **Dhawan, G.**	Chemistry & Biomedical Sciences	Chemical Papers	2021	7290, 0366	https://doi.org/10.1007/s11696-020-01355-3	https://link.springer.com/article/10.1007/s11696-020-01355-3	https://mjl.clarivate.com/search-results?issn=0366-6352&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
381	**Application of Chiotsan in Tissue Engineering**	Deka, S.R., **Gupta, S**. & Kumar, P.	Chemistry	Trends in Carbohydrate Recearch	2021	0975-0304	https://www.trendscarbo.com/getf_shoppingcart.php?id=41	https://www.trendscarbo.com/getf_shoppingcart.php?id=410026856	https://mjl.clarivate.com/search-results?issn=0975-0304&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
382	**Mannosylated and Mannan Modified nano vector targeting Resident Tissue Macrophages (RTM) for efficient pharmacotherapy**	Singh, I., **Gupta, S**., Dhawan, G**.,** & Kumar, P	Chemistry & Biomedical Sciences	Trends in Carbohydrate Research	2021	0975-0304	https://www.trendscarbo.com/getf_shoppingcart.php?id=28	https://www.trendscarbo.com/getf_shoppingcart.php?id=282868652	https://mjl.clarivate.com/search-results?issn=0975-0304&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

383	**Mannosylated and Mannan Modified nano vector targeting Resident Tissue Macrophages (RTM) for efficient pharmacotherapy**	Singh, I., Gupta, S., **Dhawan, G.,** & Kumar, P	Chemistry & Biomedical Sciences	Trends in Carbohydrate Research	2021	0975-0304	https://www.trendscarbo.com/getf_shoppingcart.php?id=28	https://www.trendscarbo.com/getf_shoppingcart.php?id=282868652	https://mjl.clarivate.com/search-results?issn=0975-0304&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
384	**Mannosylated and Mannan Modified nano vector targeting Resident Tissue Macrophages (RTM) for efficient pharmacotherapy**	Singh, I., Gupta, S., **Dhawan, G.,** & Kumar, P	Chemistry & Biomedical Sciences	Trends in Carbohydrate Research	2021	0975-0304	https://www.trendscarbo.com/getf_shoppingcart.php?id=28	https://www.trendscarbo.com/getf_shoppingcart.php?id=282868652	https://mjl.clarivate.com/search-results?issn=0975-0304&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
385	**A review targeting the infection by CHIKV using computational and experimental approaches**	Kumar, D., Kumari, K., Chandra, R., Jain, P., Vodwal, L., **Gambhir, G.**	Chemistry	Journal of Biomolecular Structure and Dynamics	2021	1102 / 153	https://doi.org/10.1080/07391102.2021.1904004	https://www.tandfonline.com/doi/abs/10.1080/07391102.2021.1904004?journalCod	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
386	**Synthesis Comparative in vitro anitbacterial antioxidant and UV Flourscence study of bis indol schiff base and molecular**	Singhal, S., **Khanna, P.,** & Khanna, L.	Chemistry	Luminescence	2021	1522-7243	https://doi.org/10.1002/bio.4098	https://analyticalsciencejournals.onlinelibrary.wiley.com/doi/10.1002/bio.4098	https://mjl.clarivate.com/search-results?issn=1522-7235&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
387	**Multitarget Diallyl Disulfides (DADS) against Aβ Aggregation: Screening through Molecular Docking with Aβ42 & ZnII-Aβ16,**	Singhal, S., Khanna, P**., Misra, N.** & Khanna, L	Chemistry	ChemistrySelect	2021	2365-6549	https://doi.org/10.1002/slct.202004635	https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/slct.202004635	https://mjl.clarivate.com/search-results?issn=2365-6549&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
388	**Multitarget Diallyl Disulfides (DADS) against Aβ Aggregation: Screening through Molecular Docking with Aβ42 & ZnII-Aβ16,**	Singhal, S., **Khanna, P.,** Misra, N. & Khanna, L	Chemistry	ChemistrySelect	2021	2365-6549	https://doi.org/10.1002/slct.202004635	https://chemistry-europe.onlinelibrary.wiley.com/doi/abs/10.1002/slct.202004635	https://mjl.clarivate.com/search-results?issn=2365-6549&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
389	**Screening of compound library identifies novel inhibitors against the MurA enzyme of Escherichia coli**	Raina D., Tiwari H., Sharma S., Deepika, Chinthakindi P.K., Nargotra	Biomedical Science	Applied Microbiology and Biotechnology	2021	7598, 1432	https://doi.org/10.1007/s00253-021-11272-4	https://link.springer.com/article/10.1007/s00253-021-11272-4	https://mjl.clarivate.com/search-results?issn=0175-7598&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
390	**Screening of compound library identifies novel inhibitors against the MurA enzyme of Escherichia coli**	Raina D., Tiwari H., Sharma S., Deepika, Chinthakindi P.K., Nargotra	Biomedical Science	Applied Microbiology and Biotechnology	2021	7598, 1432	https://doi.org/10.1007/s00253-021-11272-4	https://link.springer.com/article/10.1007/s00253-021-11272-4	https://mjl.clarivate.com/search-results?issn=0175-7598&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

391	**Shelter building behaviour of Hasora chromus (Cramer, 1780) larvae (Insecta: Lepidoptera: Hesperiidae)**	**Chaudhary, R.**	Biomedical Science	Bionotes	2021	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
392	**Properties of Motion of the Infinitesimal Variable Mass Body in the Well Known Circular Restricted Three-Body Problem with**	Ansari, A.A., Alam, M., **Meena, K.R.** & Ali, A.	Mathematics	Applied Mathematics and Information Sciences	2021	0090, 2325	doi:10.18576/amis/150211	https://www.naturalspublishing.com/files/published/5m6qq3031il0qf.pdf	https://www.scopus.com/sourceid/21100197928	Indexed in SCOPUS
393	**On Estimating Scale Parameter of the Selected Pareto Population under the Generalized Stein Loss Function**	**Meena, K.R.,** Gangopadhyay, A.K., & Abdalghani, O.	Mathematics	AMERICAN JOURNAL OF MATHEMATICAL AND	2021	5324 , 2325	https://doi.org/10.1080/01966324.2021.1891999	https://www.tandfonline.com/doi/abs/10.1080/01966324.2021.1891999	https://www.scopus.com/sourceid/24650	Indexed in SCOPUS
394	**Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19**	Das, R., Kotra, K., Singh, P., Loh, B., Leptihn, S. and **Bajpai, U**	Biomedical Science	Infectious disease and therapy	2021	3229 / 219	https://doi.org/10.1007/s40121-021-00559-8	https://link.springer.com/article/10.1007/s40121-021-00559-8	https://mjl.clarivate.com:/search-results?issn=2193-8229&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
395	**Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19**	Das, R., Kotra, K., Singh, P., Loh, B., Leptihn, S. and **Bajpai, U**	Biomedical Science	Infectious disease and therapy	2021	3229 / 219	https://doi.org/10.1007/s40121-021-00559-8	https://link.springer.com/article/10.1007/s40121-021-00559-8	https://mjl.clarivate.com:/search-results?issn=2193-8229&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
396	**Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19**	Das, R., Kotra, K., Singh, P., Loh, B., Leptihn, S. and **Bajpai, U**	Biomedical Science	Infectious disease and therapy	2021	3229 / 219	https://doi.org/10.1007/s40121-021-00559-8	https://link.springer.com/article/10.1007/s40121-021-00559-8	https://mjl.clarivate.com:/search-results?issn=2193-8229&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
397	**Synthesis and characterization of nanoselenium: A step-by-step guide for undergraduate students**	**Dhawan, G.**, Singh, I., Dhawan, U., and Kumar, P	Biomedical Science	Journal of Chemical Education	2021	9584 / 193	https://doi.org/10.1021/acs.jchemed.0c01467	https://pubs.acs.org/doi/abs/10.1021/acs.jchemed.0c01467	https://mjl.clarivate.com:/search-results?issn=0021-9584&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
398	**Self-assembled biodegradable core-shell nanocomposites of amphiphilic retinoic acid-LMW bPEI conjugates exhibit**	Ahmadi, Z., Jena, H., Singh, M., **Dhawan, G.**, and Kumar, P.	Biomedical Science	Journal of Pharmaceutical Sciences	2021	0022-3549	https://doi.org/10.1016/j.xphs.2021.04.016	https://jpharmsci.org/article/S0022-3549(21)00238-0/fulltext	https://www.scopus.com/sourceid/23079	Indexed in UGC Care List, SCOPUS and Web of Science

399	**Fluorine-containing pharmaceuticals approved by the FDA in 2020: Synthesis and biological activity**	Yu, Y., Liu, A., **Dhawan, G.**, Mei, H., Zhang, W., Izawa, K., Soloshonok, V.	Biomedical Science	Chinese Chemical Letters	2021	3417 / 187	https://doi.org/10.1016/j.cclet.2021.05.042	https://www.sciencedirect.com/science/article/abs/pii/S1001841721003557	https://mjl.clarivate.com:/search-results?issn=1001-8417&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
400	**Peroxiredoxin-6: A Guardian of Lung Pathophysiologies.**	Kumari, A., **Chowhan, R. K.**, Kakchingtabam, P., Shahnaj, S., Rahaman, H.,	Biomedical Science	Current Protein and Peptide Science	2021	2037 / 187	DOI: 10.2174/1389203722666211109101853	https://www.eurekaselect.com/article/118761	https://mjl.clarivate.com:/search-results?issn=1389-2037&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
401	**Signaling mechanisms and biochemical pathways regulating pollen-stigma interaction, seed development and seedling**	Batla, S. C., Gogna, M., Jain, P., Singh, N., Mukherjee, S., **Kalra, G.**	Botany	Plant Signaling and Behaviour	2021	2316 / 155	https://doi.org/10.1080/15592324.2021.1958129	https://www.tandfonline.com/doi/full/10.1080/15592324.2021.1958129	https://mjl.clarivate.com:/search-results?issn=1559-2316&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
402	**Unraveling the AM fungal community for understanding its ecosystem resilience to changed climate in agroecosystems**	Chourasiya D., Gupta M. M, **Sahni S.,**Oehl F., Agnihotri R., Buade R.,	Botany	Symbiosis	2021	5114 / 187	https://doi.org/10.1007/s13199-021-00761-9	https://link.springer.com/article/10.1007/s13199-021-00761-9	https://mjl.clarivate.com:/search-results?issn=0334-5114&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
403	**Al_2O_3/CuI/PANInanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives**	**Kohli, S.**, Rathee, G., Hooda, S., and Chandra, R.	Chemistry	Dalton Transactions	2021	9226 / 147	https://doi.org/10.1039/D1DT00806D	https://pubs.rsc.org/en/content/articlelanding/2021/DT/D1DT00806D	https://mjl.clarivate.com:/search-results?issn=1477-9226&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
404	**Al_2O_3/CuI/PANInanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives**	Kohli, S., Rathee, G., **Hooda, S.**, and Chandra, R.	Chemistry	Dalton Transactions	2021	9226 / 147	https://doi.org/10.1039/D1DT00806D	https://pubs.rsc.org/en/content/articlelanding/2021/DT/D1DT00806D	https://mjl.clarivate.com:/search-results?issn=1477-9226&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
405	**Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti.**	Gupta, D., **Samal, R. R.**, Gautam, D., Hooda, S., and Kumar, S.	Chemistry	Journal of Applied and Natural Science	2021	0974-9411	https://doi.org/10.31018/jans.v13i4.3018	https://journals.ansfoundation.org/index.php/jans/article/view/3018	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
406	**Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti.**	Gupta, D., Samal, R. R., Gautam, D., **Hooda, S.**, and Kumar, S.	Chemistry	Journal of Applied and Natural Science	2021	0974-9411	https://doi.org/10.31018/jans.v13i4.3018	https://journals.ansfoundation.org/index.php/jans/article/view/3018	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science

407	**Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti.**	Gupta, D., Samal, R. R., Gautam, D., **Hooda, S.**, and Kumar, S.	Chemistry	Journal of Applied and Natural Science	2021	0974-9411	https://doi.org/10.31018/jans.v13i4.3018	https://journals.ansfoundation.org/index.php/jans/article/view/3018	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
408	**Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti.**	Gupta, D., Samal, R. R., Gautam, D., Hooda, S., and **Kumar, S**.	Chemistry	Journal of Applied and Natural Science	2021	0974-9411	https://doi.org/10.31018/jans.v13i4.3018	https://journals.ansfoundation.org/index.php/jans/article/view/3018	https://www.scopus.com/sourceid/21101016916	Indexed in UGC Care List, SCOPUS and Web of Science
409	**A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater**	Saya, L., Malik, V., Gautam, D., **Gambhir, G.**, Singh, W. R. and Hooda, S.	Chemistry	Science of the Total Environment	2021	9697 / 187	https://doi.org/10.1016/j.scitotenv.2021.152529	https://www.sciencedirect.com/science/article/abs/pii/S0048969721076075?via%3D	https://mjl.clarivate.com:/search-results?issn=0048-9697&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
410	**A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater**	Saya, L., Malik, V., Gautam, D., Gambhir, G., Singh, W. R. and **Hooda, S.**	Chemistry	Science of the Total Environment	2021	9697 / 187	https://doi.org/10.1016/j.scitotenv.2021.152529	https://www.sciencedirect.com/science/article/abs/pii/S0048969721076075?via%3D	https://mjl.clarivate.com:/search-results?issn=0048-9697&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
411	**A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater**	Saya, L., Malik, V., Gautam, D., Gambhir, G., Singh, W. R. and **Hooda, S.**	Chemistry	Science of the Total Environment	2021	9697 / 187	https://doi.org/10.1016/j.scitotenv.2021.152529	https://www.sciencedirect.com/science/article/abs/pii/S0048969721076075?via%3D	https://mjl.clarivate.com:/search-results?issn=0048-9697&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
412	**A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater**	Saya, L., Malik, V., Gautam, D., Gambhir, G., Singh, W. R. and **Hooda, S.**	Chemistry	Science of the Total Environment	2021	9697 / 187	https://doi.org/10.1016/j.scitotenv.2021.152529	https://www.sciencedirect.com/science/article/abs/pii/S0048969721076075?via%3D	https://mjl.clarivate.com:/search-results?issn=0048-9697&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
413	**In water" synthesis of bis (indolyl) methanes: a review**	Khanna, L., Mansi, Yadav, S., **Misra, N.**, and Khanna, P.	Chemistry	Synthetic Communications	2021	7911 / 153	https://doi.org/10.1080/00397911.2021.1957113	https://www.tandfonline.com/doi/abs/10.1080/00397911.2021.1957113#:~:text=Bis(	https://mjl.clarivate.com:/search-results?issn=0039-7911&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
414	**In water" synthesis of bis (indolyl) methanes: a review**	Khanna, L., Mansi, Yadav, S., Misra, N., and **Khanna, P.**	Chemistry	Synthetic Communications	2021	7911 / 153	https://doi.org/10.1080/00397911.2021.1957113	https://www.tandfonline.com/doi/abs/10.1080/00397911.2021.1957113#:~:text=Bis(	https://mjl.clarivate.com:/search-results?issn=0039-7911&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

415	**A DFT Study of Interaction of (CdSe) 3 Quantum Dots with Nucleobases.**	**Malik, P.**, and Kakkar, R	Chemistry	Advanced Materials Letters	2021	0976-3961	10.5185/amlett.2021.081653	https://aml.iaamonline.org/article_14098.html	https://www.scopus.com/sourceid/21100223579	Indexed in SCOPUS
416	**Size-dependent structural and electronic properties of stoichiometric II–VI quantum dots and gas sensing ability of CdSe quantum dots: a DFT**	Singh, J., Thareja, R., **Malik, P.**, and Kakkar, R.	Chemistry	Journal of Nanoparticle Research	2021	0764 / 157	https://doi.org/10.1007/s11051-022-05406-6	https://link.springer.com/article/10.1007/s11051-022-05406-6	https://mjl.clarivate.com:/search-results?issn=1388-0764&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
417	**Surface engineered Iridium-based magnetic photocatalyst paving a path towards visible light driven CH arylation and cyanation**	Rana, P., Gaur, R., **Kaushik, B.**, P. Rana, Yadav, S., Yadav, P., Sharma, P.,	Chemistry	Journal of Catalysis	2021	9517 / 109	https://doi.org/10.1016/j.jcat.2021.08.014	https://www.sciencedirect.com/science/article/abs/pii/S002195172100316X?via%3D	https://mjl.clarivate.com:/search-results?issn=0021-9517&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
418	**Unlocking the catalytic potency of a magnetic responsive CoFe 2 O 4/Ni-BTC MOF composite for the sustainable synthesis of tri-**	Yadav, S., Dixit, R., Sharma, S., Dutta, S., Arora, B., Rana, P., **Kaushik, B.**,	Chemistry	Materials Chemistry Frontiers	2021	2052-1537	https://doi.org/10.1039/D1QM00904D	https://pubs.rsc.org/en/content/articlelanding/2021/QM/D1QM00904D	https://mjl.clarivate.com:/search-results?issn=2052-1537&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
419	**Enhanced catalysis through structurally modified hybrid 2-D boron nitride nanosheets comprising of complexed 2-hydroxy-4-**	Rana, P., Dixit, R., Sharma, S., Dutta, S., Yadav, S., Sharma, A., **Kaushik, B.**,	Chemistry	Scientific reports	2021	2045-2322	https://doi.org/10.1038/s41598-021-03992-4	https://www.nature.com/articles/s41598-021-03992-4	https://mjl.clarivate.com:/search-results?issn=2045-2322&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
420	**Identifying Central Nodes in Directed and Weighted Networks**	**Kaur, S.**, Gupta, A., and Saxena, R.	Commerce	International Journal of Advanced Computer Science and	2021	107X / 215	DOI:10.14569/IJACSA.2021.0120810	https://thesai.org/Downloads/Volume12No8/Paper_100-Identifying_Centr	https://mjl.clarivate.com:/search-results?issn=2158-107X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
421	**Perception of youth on Digital India**	**Narang, S.,** Singhania, M., Kaur, S., and Mahajan, S.	Commerce	International Journal of Business Innovation and	2021	1751-0252	https://doi.org/10.1504/IJBIR.2021.116393	https://www.inderscienceonline.com/doi/abs/10.1504/IJBIR.2021.116393	https://www.scopus.com/sourceid/11200153572	Indexed in UGC Care List and SCOPUS
422	**Perception of youth on Digital India**	Narang, S.**,** Singhania, M., **Kaur, S.,** and Mahajan, S.	Commerce	International Journal of Business Innovation and	2021	1751-0252	https://doi.org/10.1504/IJBIR.2021.116393	https://www.inderscienceonline.com/doi/abs/10.1504/IJBIR.2021.116393	https://www.scopus.com/sourceid/11200153572	Indexed in UGC Care List and SCOPUS

423	**Perception of youth on Digital India**	Narang, S., Singhania, M., Kaur, S., and **Mahajan, S.**	Commerce	International Journal of Business Innovation and	2021	1751-0252	https://doi.org/10.1504/IJBIR.2021.116393	https://www.inderscienceonline.com/doi/abs/10.1504/IJBIR.2021.116393	https://www.scopus.com/sourceid/11200153572	Indexed in UGC Care List and SCOPUS
424	**Intensity quantification of public opinion and emotion analysis on climate change**	Thukral, T., Varshney, A., and **Gaur, V**.	Computer Science	. International Journal of Advanced Technology	2021	2394-5443	DOI:10.19101/IJATEE.2021.874417	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2021/10/7.pdf	https://www.scopus.com/sourceid/21101023180	Indexed in UGC Care List and SCOPUS
425	**Intensity quantification of public opinion and emotion analysis on climate change**	Thukral, T., Varshney, A., and **Gaur, V**.	Computer Science	. International Journal of Advanced Technology	2021	2394-5443	DOI:10.19101/IJATEE.2021.874417	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2021/10/7.pdf	https://www.scopus.com/sourceid/21101023180	Indexed in UGC Care List and SCOPUS
426	**A smart learning assistance tool for inclusive education**	Srivastava, S., Varshney, A., Katyal, S., Kaur, R., and **Gaur, V.**	Computer Science	Journal of Intelligent and Fuzzy Systems	2021	1064-1246	https://doi.org/10.3233/JIFS-210075	https://dl.acm.org/doi/abs/10.3233/JIFS-210075	https://www.scopus.com/sourceid/23917	Indexed in UGC Care List and SCOPUS
427	**A smart learning assistance tool for inclusive education**	Srivastava, S., Varshney, A., Katyal, S., Kaur, R., and **Gaur, V.**	Computer Science	Journal of Intelligent and Fuzzy Systems	2021	1064-1246	https://doi.org/10.3233/JIFS-210075	https://dl.acm.org/doi/abs/10.3233/JIFS-210075	https://www.scopus.com/sourceid/23917	Indexed in UGC Care List and SCOPUS
428	**Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance.**	Dhingra, V., Kumar, S., Chowdhuri, A., and **Garg, A.**	Electronics, Physics	AIP Conference Proceedings	2021	0094-243X	https://doi.org/10.1063/5.0060996	https://aip.scitation.org/doi/abs/10.1063/5.0060996	https://www.scopus.com/sourceid/26916	Indexed in UGC Care List and SCOPUS
429	**Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance.**	**Dhingra, V.**, Kumar, S., Chowdhuri, A., and Garg, A.	Electronics, Physics	AIP Conference Proceedings	2021	0094-243X	https://doi.org/10.1063/5.0060996	https://aip.scitation.org/doi/abs/10.1063/5.0060996	https://www.scopus.com/sourceid/26916	Indexed in UGC Care List and SCOPUS
430	**Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance.**	**Dhingra, V.**, Kumar, S., Chowdhuri, A., and Garg, A.	Electronics, Physics	AIP Conference Proceedings	2021	0094-243X	https://doi.org/10.1063/5.0060996	https://aip.scitation.org/doi/abs/10.1063/5.0060996	https://www.scopus.com/sourceid/26916	Indexed in UGC Care List and SCOPUS

431	**Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance.**	Dhingra, V., Kumar, S., **Chowdhuri, A.**, and Garg, A.	Electronics, Physics	AIP Conference Proceedings	2021	0094-243X	https://doi.org/10.1063/5.0060996	https://aip.scitation.org/doi/abs/10.1063/5.0060996	https://www.scopus.com/sourceid/26916	Indexed in UGC Care List and SCOPUS
432	**Optimal ordering policy for deteriorating items with stock dependent demand, partial backlogging and trade credit period**	Verma, S.K., Rizwanullah, M. and **Singh, C.**	Mathematics	International Journal of Logistics Systems and	2021	1742-7967	https://doi.org/10.1504/IJLSM.2021.117709	https://www.inderscienceonline.com/doi/abs/10.1504/IJLSM.2021.117709	https://www.scopus.com/sourceid/47001515 04	Indexed in UGC Care List and SCOPUS
433	**A systematic review on the eco-safe management of mosquitoes with diflubenzuron: An effective growth regulatory agent**	Sankar, M. and **Kumar, S.**	Zoology	Acta Ecologica Sinica	2021	1000-0933	https://doi.org/10.1016/j.chnaes.2021.09.019	https://www.sciencedirect.com/science/article/pii/S1872032210012 44	https://mjl.clarivate.com:/search-results?issn=1000-0933&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
434	**Indigenous plants demonstrating effective antioxidant properties**	Yadav, K. S., Samal, R. R., Sahgal, A. and **Kumar, S**.	Zoology	Biology Bulletin	2021	3590 / 160	https://doi.org/10.1134/S1062359022010162	https://link.springer.com/article/10.1134/S1062359022010162	https://mjl.clarivate.com:/search-results?issn=1062-3590&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
435	**Indigenous plants demonstrating effective antioxidant properties**	Yadav, K. S., **Samal, R. R.**, Sahgal, A. and Kumar, S.	Zoology	Biology Bulletin	2021	3590 / 160	https://doi.org/10.1134/S1062359022010162	https://link.springer.com/article/10.1134/S1062359022010162	https://mjl.clarivate.com:/search-results?issn=1062-3590&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
436	**Formulation of Clitoriaternatea leaves-mediated silver nanoparticles to control Aedes aegypti larvae**	Lall, Y., **Samal, R. R.**, Sagar, S. K. and Kumar, S.	Zoology	Journal of Communicable Diseases	2021	5138 / 258	https://doi.org/10.24321/0019.5138.202157	https://medical.advancedresearchpublications.com/index.php/Journal-	https://mjl.clarivate.com:/search-results?issn=0019-5138&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
437	**Formulation of Clitoriaternatea leaves-mediated silver nanoparticles to control Aedes aegypti larvae**	Lall, Y., Samal, R. R., Sagar, S. K. and **Kumar, S.**	Zoology	Journal of Communicable Diseases	2021	5138 / 258	https://doi.org/10.24321/0019.5138.202157	https://medical.advancedresearchpublications.com/index.php/Journal-	https://mjl.clarivate.com:/search-results?issn=0019-5138&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
438	**In vitro and in silico anticancer potential analysis of Streptomyces sp. extract against human lung cancer cell line, A549**	**Kumar, P**., Chauhan, A., Kumar, M., Kuanr, B. K., Kundu, A.,	Zoology	3 Biotech	2021	572X / 219	https://doi.org/10.1007/s13205-021-02812-w	https://link.springer.com/article/10.1007/s13205-021-02812-w	https://mjl.clarivate.com:/search-results?issn=2190-572X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

439	**In vitro and in silico anticancer potential analysis of Streptomyces sp. extract against human lung cancer cell line, A549**	**Kumar, P.**, Chauhan, A., Kumar, M., Kuanr, B. K., Kundu, A.,	Zoology	3 Biotech	2021	572X / 219	https://doi.org/10.1007/s13205-021-02812-w	https://link.springer.com/article/10.1007/s13205-021-02812-w	https://mjl.clarivate.com:/search-results?issn=2190-572X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
440	**In vitro and in silico anticancer potential analysis of Streptomyces sp. extract against human lung cancer cell line, A549**	Kumar, P., Chauhan, A., Kumar, M., Kuanr, B. K., Kundu, A.,	Zoology	3 Biotech	2021	572X / 219	https://doi.org/10.1007/s13205-021-02812-w	https://link.springer.com/article/10.1007/s13205-021-02812-w	https://mjl.clarivate.com:/search-results?issn=2190-572X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
441	**Sightings of the Tailless Llineblue, Prosotasdubiosa (Insecta: Lepidoptera: Lycaenidae) in Delhi, India**	**Chaudhary, R.** and Maurya, C. B.	Biomedical Science	Bionotes	2021	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
442	**Sighting of Plain Tiger (Danaus chrysippus, Linn., 1758) form dorippus in New Delhi, India**	**Chaudhary, R.**	Biomedical Science	Bionotes	2021	0972-1800	https://www.entosocindia.org/image/catalog/bionotes/Bion	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
443	**Genera of ants associated with larvae of Plains Cupid (Chiladespandava,horsfield, 1829) linsecta: Lepidoptera: Lycaenidae) infesting Cycas,**	**Chaudhary, R.** and Kumar, V.	Biomedical Science	Bionotes	2021	0972-1800	https://www.entosocindia.org/image/catalog/bionotes/Bion	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
444	**Genera of ants associated with larvae of Plains Cupid (Chiladespandava,horsfield, 1829) linsecta: Lepidoptera: Lycaenidae) infesting Cycas,**	**Chaudhary, R.** and Kumar, V.	Biomedical Science	Bionotes	2021	0972-1800	https://www.entosocindia.org/image/catalog/bionotes/Bion	https://www.entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
445	**COVID-19 and cardiovascular disease: Clinical implications of biochemical pathways.**	Varmani, S. G., **Chowhan, R. K.**, Sharma, I., and Narang, R.	Biomedical Science	Journal of the Practice of Cardiovascular Science	2021	5414 / 245	10.4103/jpcs.jpcs_21_21	https://journals.lww.com/jpcs/fulltext/2021/07020/covid_19_and_cardiovascular_dis	https://mjl.clarivate.com:/search-results?issn=2395-5414&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science
446	**The Dynamical Study of Variable Mass Test Particle in Nonlinear Sense of Restricted 3-body Problem with Heterogeneous Primaries**	**Prasad, S. N.,** Shalini, K., and Ansari, A. A	Mathematics	Application and Applied Mathematics	2021	1932-9466	https://digitalcommons.pvamu.edu/aam/vol16/iss2/28/	https://digitalcommons.pvamu.edu/aam/vol16/iss2/28/	https://mjl.clarivate.com:/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	Indexed in Web of Science

447	**Development of Dimethylisoxazole-Attached Imidazo [1, 2-a] pyridines as Potent and Selective CBP/P300 Inhibitors.**	Muthengi, A., Wimalasena, V.K., Yosief, H.O., Bikowitz, M.J., Sigua, L.H.,	Biomedical sciences	*Journal of Medicinal Chemistry*	2021	0022-2623	https://doi.org/10.1021/acs.jmedchem.0c02232	https://pubs.acs.org/doi/10.1021/acs.jmedchem.0c02232	https://mjl.clarivate.com:/search-results?issn=0022-2623&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
448	**Ex vivo binding studies of the anti-cancer drug noscapine with human hemoglobin: a spectroscopic and molecular docking study.**	Chugh, H., Kumar, P., Kumar, N., Gaur, R. K.**, Dhawan, G.**, & Chandra,	Biomedical sciences	*New Journal of Chemistry*	2021	1.1E+07	https://doi.org/10.1039/D0NJ03334K	https://pubs.rsc.org/en/content/articlelanding/2021/NJ/D0NJ03334K	https://mjl.clarivate.com:/search-results?issn=1144-0546&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
449	**Targeting unfolded protein response: a new horizon for disease control**	Khanna, M., Agrawal, N., Chandra, R., & **Dhawan, G**.	Biomedical sciences	Expert Reviews *in Molecular Medicine*	2021		https://doi.org/10.1017/erm.2021.2	https://www.cambridge.org/core/journals/expert-reviews-in-molecular-	https://mjl.clarivate.com:/search-results?issn=1462-3994&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
450	**Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices**	**Chowdhuri, A.,** Saraswat, S. and Gupta, C. K.	Physics	Research Journal of Educational Science	2021	2321 - 0508	http://www.isca.me/EDU_SCI/Archive/v9/i1/1.ISCA-RJEduS-	http://www.isca.in/EDU_SCI/Archive/v9/i1/1.ISCA-RJEduS-2020-003.php	nil	**PEER REVIEWED**
451	**Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices**	**Chowdhuri, A.,** Saraswat, S. and Gupta, C. K.	Physics	Research Journal of Educational Science	2021	2321 - 0508	http://www.isca.me/EDU_SCI/Archive/v9/i1/1.ISCA-RJEduS-	http://www.isca.in/EDU_SCI/Archive/v9/i1/1.ISCA-RJEduS-2020-003.php	nil	**PEER REVIEWED**
452	**Pressure Ionization, Polarizability and Screening Constants in Confined Hydrogen Like Ions of Astrophysical Importance**	**Joshi, R.,** Kumar, P., Jha, A. K., and Kumar, T.	Physics	Journal of Atomic, Molecular, Condensed Matter and	2021	2582-8215	https://doi.org/10.26713/jamcnp.v8i2.1684	https://www.rgnpublications.com/journals/index.php/jamcnp/article/view/1684	nil	**PEER REVIEWED**
453	**Encompassing environment synthesis, characterization and photovoltaic utilization of cadmium sulphide quantum dots**	Singh, Shruti; Singh, Pramod K; Sharma,Jitender Paul; Kakroo, Sunanda**;**	Physics	Materials Today: Proceedings	2021	2214-7853	https://doi.org/10.1016/j.matpr.2020.04.776	https://www.sciencedirect.com/science/article/abs/pii/S2214785320334301	https://www.scopus.com/sourceid/21100370037	**Indexed in UGC Care List and SCOPUS**
454	**Reliable Time Slot Allocation Scheme among Mobile Nodes in MANET**	**C. K. Samal**	Computer science	International Journal of Computer Science Trends and	2021	2347-8578	http://www.ijcstjournal.org/volume-9/issue-5/IJCST-	http://www.ijcstjournal.org/volume-9/issue-5/IJCST-V9I5P12.pdf	nil	**PEER REVIEWED**

455	**Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population**	Arora, G., Taneja, J., Bhardwaj, P., **Goyal, S.**, Naidu, K., Yadav, S. K.,	Biomedical Science	Jounal of Medical Virology	2022	0146-6615 / 1096-9071	.org/10.1002/	https://onlinelibrary.wiley.com/doi/10.1002/jmv.27708	https://mjl.clarivate.com:/search-results?issn=0146-6615&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
456	**Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population**	Arora, G., Taneja, J., Bhardwaj, P., Goyal, S., Naidu, K., Yadav, S. K.,	Biomedical Science	Jounal of Medical Virology	2022	0146-6615 / 1096-9071	.org/10.1002/	https://onlinelibrary.wiley.com/doi/10.1002/jmv.27708	https://mjl.clarivate.com:/search-results?issn=0146-6615&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
457	**Association of gender, age, and comorbidities with COVID-19 infection in India**	Yadav, S., Bhardwaj, P., Gupta, P., Saluja, D., **Jetly, S.** and Taneja, J	Biomedical Science	Journal of Integrated Science and Technology	2022	2321-4635	http://pubs.iscience.in/journal/index.php/jist/article/view/14	http://pubs.iscience.in/journal/index.php/jist/article/view/1411	https://www.scopus.com/sourceid/21101065486	Indexed in SCOPUS
458	**Hesitancy and Acceptance of COVID-19 Vaccination Amidst the Second Wave of Pandemic in India: A General Population Study**	**Jetly, S.,** Bhardwaj, P., Arora, G., Saluja, D., Yadav, S. K., Naidu, K. P. and	Biomedical Science	Asia Pacific Journal of Public Health	2022	1010-5395 / 1941-2479	10.1177/1010	https://journals.sagepub.com/doi/10.1177/10105395221077062	https://mjl.clarivate.com:/search-results?issn=1010-5395&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
459	**Bioreducible polyethyleneimine core-shell nanostructures as efficient and non-toxic gene and drug delivery vectors.**	Jena, H., Ahmadi, Z., Kumar, P and **Dhawan, G**	Biomedical Science	Bioorganic and Medicinal Chemistry	2022	0968-0896 / 1464-3391	/10.1016/j.bm	https://www.sciencedirect.com/science/article/abs/pii/S0968089622002784	https://mjl.clarivate.com:/search-results?issn=0968-0896&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
460	**Exploring the role of framework mutations in enabling breadth of a cross-reactive antibody (CR3022) against the SARS-CoV-2 RBD**	Saini, S., Agarwal, M., Pradhan, A., Pareek, S., Singh, A. K., **Dhawan,**	Biomedical Science	Journal of Biomolecular Structure and Dynamics	2022	0739-1102 / 1538-0254	.1080/07391	https://www.tandfonline.com/doi/abs/10.1080/07391102.2022.2030800?journalCod	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
461	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., **Gautam, D.**, Sachdeva, S., Dheer, N., Arya, D. K., Gambhir,	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s002	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
462	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., Gautam, D., **Sachdeva, S.**, Dheer, N., Arya, D. K., Gambhir,	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s002	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

463	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., Gautam, D., Sachdeva, S., **Dheer, N.,** Arya, D. K., Gambhir,	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s002	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
464	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., Gautam, D., Sachdeva, S., Dheer, N., **Arya, D. K.**, Gambhir,	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s002	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
465	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., Gautam, D., Sachdeva, S., Dheer, N., Arya, D. K., **Gambhir,**	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s002	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
466	**Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites**	Malik, V., Saya, L., Gautam, D., Sachdeva, S., Dheer, N., Arya, D. K., Gambhir,	Chemistry	Polymer Bulletin	2022	0170-0839 / 1436-2449	10.1007/s002	https://link.springer.com/article/10.1007/s00289-021-03991-5	https://mjl.clarivate.com:/search-results?issn=0170-0839&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
467	**A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions**	**Gambhir, G.**, Gautam, D., Saya, L., Kumar, A., Kumar, S., Singh, A., Singh,	Chemistry	Asian Journal of Chemistry	2022	2193-5807 / 2193-5815	https://doi.org/10.14233/ajchem.2022.23701	https://asianjournalofchemistry.co.in/user/journal/viewarticle.aspx?ArticleID=34_3_	https://mjl.clarivate.com:/search-results?issn=2193-5807&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
468	**A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions**	Gambhir, G., Gautam, D., Saya, L., Kumar, A., Kumar, S., Singh, A., Singh,	Chemistry	Asian Journal of Chemistry	2022	2193-5807 / 2193-5815	https://doi.org/10.14233/ajchem.2022.23701	https://asianjournalofchemistry.co.in/user/journal/viewarticle.aspx?ArticleID=34_3_	https://mjl.clarivate.com:/search-results?issn=2193-5807&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
469	**A Novel Terpolymer Membrane-Based Electrode Sensor for Selective Determination of Cd(II) Ions**	Gambhir, G., Gautam, D., Saya, L., Kumar, A., Kumar, S., Singh, A., Singh,	Chemistry	Asian Journal of Chemistry	2022	2193-5807 / 2193-5815	https://doi.org/10.14233/ajchem.2022.23701	https://asianjournalofchemistry.co.in/user/journal/viewarticle.aspx?ArticleID=34_3_	https://mjl.clarivate.com:/search-results?issn=2193-5807&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and SCOPUS
470	**A new polysaccharide-based ion-exchange resin for industrial wastewater treatment**	Bargujar, S., Gambhir, G., Raigar, M. B., Hooda, S., Arya, D. K. and **Bhatia,**	Chemistry	Polimery	2022	0032-2725	10.14314/po	http://polimery.icbp.vot.pl/index.php/p/article/view/1135	https://mjl.clarivate.com:/search-results?issn=0032-2725&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

471	**A new polysaccharide-based ion-exchange resin for industrial wastewater treatment**	Bargujar, S., **Gambhir, G.**, Raigar, M. B., Hooda, S., Arya, D. K. and Bhatia,	Chemistry	Polimery	2022	0032-2725	/10.14314/po	http://polimery.ichp.vot.pl/index.php/p/article/view/1135	https://mjl.clarivate.com:/search-results?issn=0032-2725&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
472	**A new polysaccharide-based ion-exchange resin for industrial wastewater treatment**	Bargujar, S., Gambhir, G., Raigar, M. B., **Hooda, S.**, Arya, D. K. and Bhatia,	Chemistry	Polimery	2022	0032-2725	/10.14314/po	http://polimery.ichp.vot.pl/index.php/p/article/view/1135	https://mjl.clarivate.com:/search-results?issn=0032-2725&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
473	**A new polysaccharide-based ion-exchange resin for industrial wastewater treatment**	Bargujar, S., Gambhir, G., Raigar, M. B., Hooda, S**., Arya, D. K.** and Bhatia,	Chemistry	Polimery	2022	0032-2725	/10.14314/po	http://polimery.ichp.vot.pl/index.php/p/article/view/1135	https://mjl.clarivate.com:/search-results?issn=0032-2725&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
474	**Assessment of Groundwater Suitability for Drinking and Irrigation in Gurugram Block of Gurugram district, Haryana, India.**	Laxmi, V., Hussain, J., Husain, I., Vadiya, V. K. and **Gambhir, G.**	Chemistry	Asian Journal of Chemistry	2022	0970-7077	https://doi.org/10.14233/ajchem.2022.23779	https://asianjournalofchemistry.co.in/user/journal/viewarticle.aspx?ArticleID=34_6_	https://www.scopus.com/sourceid/22703	Indexed in UGC Care List and SCOPUS
475	**A DFT Study on Diels-Alder Reaction of Dibenzazepine and 2,5-Dimethylfuran Using Different Solvents and Temperature Conditions.**	Yadav, S., Misra, N., **Khanna, P.**, Mansi, Batra, K., and Khanna, L.	Chemistry	Polycyclic Aromatic Compounds	2022	1040-6638 / 1563-5333	https://doi.org/10.1080/10406638.2022.2056622	https://www.tandfonline.com/doi/full/10.1080/10406638.2022.2056622	https://mjl.clarivate.com:/search-results?issn=1040-6638&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
476	**A DFT Study on Diels-Alder Reaction of Dibenzazepine and 2,5-Dimethylfuran Using Different Solvents and Temperature Conditions.**	Yadav, S., **Misra, N.**, Khanna, P., Mansi, Batra, K., and Khanna, L.	Chemistry	Polycyclic Aromatic Compounds	2022	1040-6638 / 1563-5333	https://doi.org/10.1080/10406638.2022.2056622	https://www.tandfonline.com/doi/full/10.1080/10406638.2022.2056622	https://mjl.clarivate.com:/search-results?issn=1040-6638&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
477	**Chromone functionalized pyridine chemosensor for cupric ions detection.**	Bhalla, P., Tomer, N., **Bhagat, P.**, and Malhotra, R.	Chemistry	Spectrochimica Acta Part A: Molecular and	2022	1386-1425 / 1873-3557	/10.1016/j.sa	https://www.sciencedirect.com/science/article/abs/pii/S1386142521008568?via%3D	https://mjl.clarivate.com:/search-results?issn=1386-1425&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
478	**Chromone derived effective probe for the detection of metal ion (Cu^{2+}) and chemical explosive (p-nitrotoluene).**	Tomer, N., Goel, A., Bhalla, P., **Bhagat, P.**, and Malhotra, R	Chemistry	Journal of Photochemistry and Photobiology A:	2022	1010-6030 / 1873-2666	1016/j.jphoto	https://www.sciencedirect.com/science/article/abs/pii/S1010603022000545	https://mjl.clarivate.com:/search-results?issn=1010-6030&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

479	**Wet Chemical Growth of One Dimensional ZnO Film**	Meena, P. L., Kumar, Y., Bhardwaj, P., Genwa, M., **Arya, D. K.**,	Chemistry	Rasayan Journal of Chemistry	2022	0974-1496	http://rasayanjournal.co.in/admin/php/upload/3482_pdf.pdf	http://rasayanjournal.co.in/admin/php/upload/3482_pdf.pdf	https://www.scopus.com/sourceid/19400157518	Indexed in UGC Care List and SCOPUS
480	**An in-Silico investigation for acyclovir and its derivatives to fight the COVID-19: Molecular docking, DFT calculations, ADME and td-**	Singh, M. B., Jain, P., Tomar, J., Kumar, V., Bahadur, I., **Arya, D. K.**, Sing,	Chemistry	Journal of the Indian Chemical Society	2022	0019-4522	/10.1016/j.jic	https://www.sciencedirect.com/science/article/pii/S0019452222000954	https://mjl.clarivate.com:/search-results?issn=0019-4522&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
481	**II-VI core/shell quantum dots and doping with transition metal ions as a means of tuning the magnetoelectronic**	**Malik, P.**, Thareja, R., Singh, J., and Kakkar, R.	Chemistry	Journal of Molecular Graphics and Modelling	2022	1093-3263 / 1873-4243	10.1016/j.jmg	https://www.sciencedirect.com/science/article/abs/pii/S1093326321002709	https://mjl.clarivate.com:/search-results?issn=1093-3263&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
482	**Precisely engineered type II ZnO-CuS based heterostructure: A visible light driven photocatalyst for efficient mineralization of**	**Kaushik, B.**, Yadav, S., Rana, P., Rana, P., Solanki, K., Rawat, D., and	Chemistry	Applied Surface Science	2022	0169-4332 / 1873-5584	10.1016/j.aps	https://www.sciencedirect.com/science/article/abs/pii/S0169433222006201	https://mjl.clarivate.com:/search-results?issn=0169-4332&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
483	**Ingeniously designed Silica nanostructures as an exceptional support: Opportunities, potential challenges and future**	Sharma, R. K., **Kaushik, B.**, Yadav, S., Rana, P., Rana, P., Solanki, K., and	Chemistry	Journal of Environmental Management	2022	0301-4797 / 1095-8630	0.1016/j.jenv	https://www.sciencedirect.com/science/article/pii/S0301479721018831#!	https://mjl.clarivate.com:/search-results?issn=0301-4797&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
484	**Magnetically separable type-II semiconductor based ZnO/MoO 3 photocatalyst: a proficient system for heteroarenes arylation and**	**Kaushik, B.**, Rana, P., Rawat, D., Solanki, K., Yadav, S., and Sharma, R. K.	Chemistry	New Journal of Chemistry	2022	1144-0546 / 1369-9261	https://doi.org/10.1039/D2NJ00906D	https://pubs.rsc.org/en/content/articlelanding/2022/nj/d2nj00906d	https://mjl.clarivate.com:/search-results?issn=1144-0546&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
485	**An Earth-abundant cobalt based photocatalyst: visible light induced direct (het) arene C–H arylation and CO2 capture**	Rana, P., **Kaushik, B.**, Gaur, R., Dutta, S., Yadav, S., Rana, P., Solanki,	Chemistry	Dalton Transactions	2022	1477-9226 / 1477-9234	https://doi.org/10.1039/D1DT03625D	https://pubs.rsc.org/en/content/articlelanding/2022/DT/D1DT03625D	https://mjl.clarivate.com:/search-results?issn=1477-9226&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
486	**Magnetic Boron Nitride Nanosheets Decorated with Cobalt Nanoparticles as Catalyst for the Synthesis of 3, 4-Dihydropyrimidin-2 (1 H)-**	Rana, P., Dixit, R., Sharma, S., Dutta, S., Yadav, S., Arora, B., **B. Kaushik**, Rana,	Chemistry	ACS Applied Nano Materials	2022	2574-0970	g/10.1021/acs	https://pubs.acs.org/doi/10.1021/acsanm.1c04438	https://mjl.clarivate.com:/search-results?issn=2574-0970&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

487	**Unravelling the catalytic potential of a magnetic CoFe 2 O 4/Cu–ABDC MOF composite in the sustainable synthesis of 2 H-indazole**	Yadav, S., Dixit, R., Sharma, S., Dutta, S., Arora, B., Rana, P., **Kaushik, B.,**	Chemistry	New Journal of Chemistry	2022	1144-0546 / 1369-9261	https://doi.org/10.1039/D2NJ01490D	https://pubs.rsc.org/en/content/articlelanding/2022/nj/d2nj01490d/unauth	https://mjl.clarivate.com:/search-results?issn=1144-0546&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
488	**Functionalized MCM-41: Versatile Catalysts for Organic Transformations**	Pasricha, S., Gahlot, P., **Mittal, K.**, Rai, D., Avasthi, N., Kaur, H., and	Chemistry	ChemistrySelect	2022	2365-6549	https://doi.org/10.1002/slct.202103674	https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/slct.202103674	https://mjl.clarivate.com:/search-results?issn=2365-6549&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
489	**Coupling Fear and Contagion for Modeling Epidemic Dynamics**	Jain K., Bhatnagar V, Prasad S. and **Kaur S.**	Commerce	IEEE Transactions on Network Science and	2022	2327-4697	09/TNSE.202	https://ieeexplore.ieee.org/document/9813421	https://mjl.clarivate.com:/search-results?issn=2327-4697&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
490	**Behaviour of motion of infinitesimal variable mass oblate body in the generalized perturbed circular restricted three-body**	Ansari, A. A., **Narain, L.,** Prasad, S. N., and Alam, M.	Mathematics	Italian Journal of Pure and Applied Mathematics	2022	1126-8042 / 2239-0227	https://ijpam.uniud.it/online_issue/202247/15%20Ansari-	https://ijpam.uniud.it/online_issue/202247/15%20Ansari-Narain-Prasad-Alam.pdf	https://mjl.clarivate.com:/search-results?issn=1126-8042&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
491	**Behaviour of motion of infinitesimal variable mass oblate body in the generalized perturbed circular restricted three-body**	Ansari, A. A., Narain, L**.,** **Prasad, S. N.**, and Alam, M.	Mathematics	Italian Journal of Pure and Applied Mathematics	2022	1126-8042 / 2239-0227	https://ijpam.uniud.it/online_issue/202247/15%20Ansari-	https://ijpam.uniud.it/online_issue/202247/15%20Ansari-Narain-Prasad-Alam.pdf	https://mjl.clarivate.com:/search-results?issn=1126-8042&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
492	**Study and prediction of prostate cancer using fuzzy inference system**	Boadh, R., **Aarya, D. D.**, Dahiya, M., Rathee, S., Kumar, A., Jain,	Mathematics	Materials Today: Proceedings	2022	2214-7853	10.1016/j.ma	https://www.sciencedirect.com/science/article/pii/S2214785322000669#:~:text=It%2	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS
493	**Selling price, time dependent demand and variable holding cost inventory model with two storage facilities.**	**Aarya, D. D.**, Rajoria, Y. K., Gupta, N., Raghav, Y. S., Rathee, R.,	Mathematics	Materials Today: Proceedings	2022	2214-7854	10.1016/j.ma	https://www.sciencedirect.com/science/article/pii/S2214785322001390	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS
494	**Two Ware-Houses Fuzzy Inventory Model For Deteriorating Items With Ramp Type Demand And Shortages**	Sethi, G., Yadav, A.S. and **Singh, C.**	Mathematics	Journal of Management Information and	2022	1524-7252	0.5120/19994	https://www.abacademies.org/articles/two-warehouses-fuzzy-inventory-	https://www.scopus.com/sourceid/21100805732	Indexed in UGC Care List and SCOPUS

495	**Smart materials for cardiovascular devices**	**Bhatia M.**, Bhatia S. and Siddhartha.	Physics	Materials Today: Proceedings	2022	2214-7853	10.1016/j.ma	https://www.sciencedirect.com/science/article/pii/S2214785322001237	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS
496	**Smart materials for cardiovascular devices**	Bhatia M., Bhatia S. and **Siddhartha.**	Physics	Materials Today: Proceedings	2022	2214-7853	10.1016/j.ma	https://www.sciencedirect.com/science/article/pii/S2214785322001237	https://www.scopus.com/sourceid/21100370037	Indexed in UGC Care List and SCOPUS
497	**Studies on Energy Storage properties of BFO/WO3 bilayer thin film capacitor.**	Lamichhane, S., Sharma, S., Tomar, M., and **Chowdhuri, A**	Physics	Energy Storage	2022	2578-4862	i.org/10.1002	https://onlinelibrary.wiley.com/doi/abs/10.1002/est2.342	https://mjl.clarivate.com:/search-results?issn=2578-4862&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
498	**Double quantum ionization cross-sections for more general exponential cosine screened coulomb potential**	**Joshi, R.**	Physics	Spectroscopy Letters	2022	0038-7010 / 1532-2289	https://doi.org/10.1080/00387010.2022.2088559	https://www.tandfonline.com/doi/full/10.1080/00387010.2022.2088559	https://mjl.clarivate.com:/search-results?issn=0038-7010&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
499	**Micrometre double-quantum ionization of Rydberg hydrogen using linearly and circularly polarized light**	**Joshi, R.**	Physics	The European Physical Journal D	2022	1434-6060 / 1434-6079	https://doi.org/10.1140/epjd/s10053-022-00366-x	https://link.springer.com/article/10.1140/epjd/s10053-022-00366-x	https://mjl.clarivate.com:/search-results?issn=1434-6060&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
500	**High harmonic generation spectra for lithium embedded in plasma environment**	**Joshi, R.**	Physics	Spectroscopy Letters	2022	0038-7010 / 1532-2289	https://doi.org/10.1080/00387010.2022.2046104	https://www.tandfonline.com/doi/full/10.1080/00387010.2022.2046104	https://mjl.clarivate.com:/search-results?issn=0038-7010&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
501	**A numerical evaluation of Shannon entropy for modified Hulthen potential**	Dabas, S., and **Joshi, R.**	Physics	The European Physical Journal D	2022	1434-6060 / 1434-6079	https://doi.org/10.1140/epjd/s10053-022-00421-7	https://link.springer.com/article/10.1140/epjd/s10053-022-00421-7	https://mjl.clarivate.com:/search-results?issn=1434-6060&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
502	**Favourable tuning of optical absorbance, bandgap and surface roughness of ZnO thin films by C ion implantation at the critical**	Hariwal, R. V., Malik, H. K., **Negi, A.**, and Asokan, K.	Physics	Applied Surface Science Advances	2022	2666-5239	0.1016/j.apsa	https://www.sciencedirect.com/science/article/pii/S2666523921001355	https://mjl.clarivate.com:/search-results?issn=2666-5239&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science

503	**Unravelling impacts of C ion implantations at polar angles in the physical properties of ZnO nanostructured thin films**	Hariwal, R. V., Malik, H. K., **Negi, A.**, and Asokan, K.	Physics	Materials Letters	2022	0167-577X / 1873-4979	10.1016/j.mat	https://www.sciencedirect.com/science/article/abs/pii/S0167577X2101898X	https://mjl.clarivate.com:/search-results?issn=0167-577X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
504	**Spatiotemporal nonlinear evolution of the laser pulse and turbulence generation in laser produced plasmas.**	Singh, I., **Gupta, P. K.**, Uma, R. and Sharma, R. P.	Physics	Physics of Plasmas	2022	1070-664X / 1089-7674	.org/10.1063/	https://aip.scitation.org/doi/abs/10.1063/5.0085724	https://mjl.clarivate.com:/search-results?issn=1070-664X&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
505	**Effect of Ag doping on structural, morphological and optical properties of CdO nanostructured thin films.**	Khan Z. R., Alshammari A. S., Shkir Md., Bouzidi M., Mohamed M.,	Physics	Physica B: Condensed Matter	2022	0921-4526 / 1873-2135	10.1016/j.phy	https://www.sciencedirect.com/science/article/abs/pii/S0921452622001016	https://mjl.clarivate.com:/search-results?issn=0921-4526&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
506	**Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, Aedes aegypti L**	**Samal, R. R.**, Panmei, K., Lanbiliu, P. and Kumar, S	Zoology	Bulletin of Entomological Research	2022	0007-4853 / 1475-2670	doi:10.1017/S0007485321001140	https://www.cambridge.org/core/journals/bulletin-of-entomological-research/article/r	https://mjl.clarivate.com:/search-results?issn=0007-4853&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
507	**Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, Aedes aegypti L**	Samal, R. R., Panmei, K., **Lanbiliu, P**. and Kumar, S	Zoology	Bulletin of Entomological Research	2022	0007-4853 / 1475-2670	doi:10.1017/S0007485321001140	https://www.cambridge.org/core/journals/bulletin-of-entomological-research/article/r	https://mjl.clarivate.com:/search-results?issn=0007-4853&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
508	**Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, Aedes aegypti L**	Samal, R. R., Panmei, K., Lanbiliu, P. and **Kumar, S**	Zoology	Bulletin of Entomological Research	2022	0007-4853 / 1475-2670	doi:10.1017/S0007485321001140	https://www.cambridge.org/core/journals/bulletin-of-entomological-research/article/r	https://mjl.clarivate.com:/search-results?issn=0007-4853&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
509	**Attractive sugar bait formulation for development of Attractive Toxic Sugar Bait for control of Aedes aegypti (Linnaeus).**	**Kumar, S.** Sharma, A. Samal, R. R., Kumar, M., Verma, V.,	Zoology	Journal of Tropical Medicine	2022	1687-9686 / 1687-9694	rg/10.1155/2(	https://www.hindawi.com/journals/jtm/2022/2977454/	https://mjl.clarivate.com:/search-results?issn=1687-9686&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
510	**Attractive sugar bait formulation for development of Attractive Toxic Sugar Bait for control of Aedes aegypti (Linnaeus).**	Kumar, S. Sharma, A. Samal, R. R., Kumar, M., Verma, V.,	Zoology	Journal of Tropical Medicine	2022	1687-9686 / 1687-9694	rg/10.1155/2(	https://www.hindawi.com/journals/jtm/2022/2977454/	https://mjl.clarivate.com:/search-results?issn=1687-9686&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

511	**Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in**	Somasundaram, S., Abraham, J. S., Maurya, **S., Toteja, R.**, Gupta, R., and	Zoology	Ecotoxicology	2022	0963-9292 / 1573-3017	10.1007/s106	https://link.springer.com/article/10.1007/s10646-021-02518-y	https://mjl.clarivate.com:/search-results?issn=0963-9292&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
512	**Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in**	Somasundaram, S., Abraham, J. S., Maurya, **S.,** Toteja, R., Gupta, R., and	Zoology	Ecotoxicology	2022	0963-9292 / 1573-3017	10.1007/s106	https://link.springer.com/article/10.1007/s10646-021-02518-y	https://mjl.clarivate.com:/search-results?issn=0963-9292&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
513	**Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in**	Somasundaram, S., Abraham, J. S., Maurya, **S.,** Toteja, R., Gupta, R., and	Zoology	Ecotoxicology	2022	0963-9292 / 1573-3017	10.1007/s106	https://link.springer.com/article/10.1007/s10646-021-02518-y	https://mjl.clarivate.com:/search-results?issn=0963-9292&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
514	**Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in**	Somasundaram, S., Abraham, J. S., Maurya, **S.,** Toteja, R., Gupta, R., and	Zoology	Ecotoxicology	2022	0963-9292 / 1573-3017	10.1007/s106	https://link.springer.com/article/10.1007/s10646-021-02518-y	https://mjl.clarivate.com:/search-results?issn=0963-9292&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
515	**Molecular characterization and transcriptional modulation of stress-responsive genes under heavy metal stress in**	Somasundaram, S., Abraham, J. S., Maurya, **S.,** Toteja, R., Gupta, R., and	Zoology	Ecotoxicology	2022	0963-9292 / 1573-3017	10.1007/s106	https://link.springer.com/article/10.1007/s10646-021-02518-y	https://mjl.clarivate.com:/search-results?issn=0963-9292&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
516	**Microbial Journey: Mount Everest to Mars**	Sood, U., Dhingra, G. G., Anand, S., Hira, P., Kumar, R., Kaur, J., Verma,	Zoology	Indian Journal of Microbiology	2022	0046-8991 / 0973-7715	10.1007/s120	https://link.springer.com/article/10.1007/s12088-022-01029-6	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
517	**Microbial Journey: Mount Everest to Mars**	Sood, U., Dhingra, G. G., Anand, S., Hira, P., Kumar, R., Kaur, J., Verma,	Zoology	Indian Journal of Microbiology	2022	0046-8991 / 0973-7715	10.1007/s120	https://link.springer.com/article/10.1007/s12088-022-01029-6	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
518	**Microbial Journey: Mount Everest to Mars**	Sood, U., Dhingra, G. G., Anand, S., Hira, P., Kumar, R., Kaur, J., Verma,	Zoology	Indian Journal of Microbiology	2022	0046-8991 / 0973-7715	10.1007/s120	https://link.springer.com/article/10.1007/s12088-022-01029-6	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

519	**Microbial Journey: Mount Everest to Mars**	Sood, U., Dhingra, G. G., Anand, S., Hira, P., Kumar, R., Kaur, J., Verma,	Zoology	Indian Journal of Microbiology	2022	0046-8991 / 0973-7715	10.1007/s120	https://link.springer.com/article/10.1007/s12088-022-01029-6	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
520	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
521	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
522	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
523	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
524	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
525	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science
526	**A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the**	Maurya, S., Abraham, J. S., Somasundaram, S., Dagar, J., Gupta, R.,	Zoology	Eurasian Soil Science	2022	1064-2293 / 1556-195X	10.1134/S106	https://link.springer.com/article/10.1134/S1064229322080117	https://mjl.clarivate.com:/search-results?issn=1064-2293&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List, SCOPUS and Web of Science

527	**The Role of Nanotechnology in Antiviral Regime: An Overview**	Singh, R., **Gupta, S.** and Kumar, P.	Chemistry	Nano Life	2022	1793-9844 / 1793-9852	10.1142/S179	https://www.worldscientific.com/doi/abs/10.1142/S1793984421300119	https://mjl.clarivate.com:/search-results?issn=1793-9844&hide_exact_match_fl=true&utm_sourc	Indexed in UGC Care List and Web of Science
528	**Identification of perturbed pathways rendering susceptibility to tuberculosis in type 2 diabetes mellitus patients using BioNSi**	Rani, J.; Bhargav, A.; Seth, S.; Datta, M.; **Bajpai, U.**; Ramachnadran,	Biomedical Sciences	J Biosci 47:69.	2022	6991 / 097	https://doi.org/10.1007/s12038-022-00309-z	ias.ac.in/article/fulltext/jbsc/047/0069	https://mjl.clarivate.com:/search-results?issn=0250-5991&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
529	**Identification of perturbed pathways rendering susceptibility to tuberculosis in type 2 diabetes mellitus patients using BioNSi**	Rani, J.; Bhargav, A.; Seth, S.; Datta, M.; **Bajpai, U.**; Ramachnadran,	Biomedical Sciences	J Biosci 47:69.	2022	6991 / 097	https://doi.org/10.1007/s12038-022-00309-z	ias.ac.in/article/fulltext/jbsc/047/0069	https://mjl.clarivate.com:/search-results?issn=0250-5991&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
530	**Pharmacological Manipulation of UPR: Potential Antiviral Strategy Against Chikungunya Virus.**	Agrawal, N.; Saini, S.; Khanna, M.**; Dhawan, G.;** Dhawan, U.	Biomedical Sciences	Indian Journal of Microbiology	2022	0255-0857 / 1998-3646	https://doi.org/10.1007/s12088-022-01046-5	https://pubmed.ncbi.nlm.nih.gov/36458214/	https://mjl.clarivate.com:/search-results?issn=0046-8991&hide_exact_match_fl=true&utm_sourc	**Indexed in UGC Care List, SCOPUS and Web of Science**
531	**Realizing the New Reality: Machine Learning Curbing Antimicrobial Resistance in Cutibacterium acnes.**	Gupta, R.**; Dhawan, G.;** Kumar, B.; Gautam, H. K.	Biomedical Sciences	Research Journal of Biotechnology, 17, 165-170.	2022	2588-9834 / 2588-9842	https://doi.org/10.25303/1712rjbt1650170	–	https://mjl.clarivate.com:/search-results?issn=2278-4535&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
532	**Upsurge in biomedical waste due to COVID-19 in India: A statistical correlation, challenges and recommendations.**	**Khosla, R.;** Jha, A.; Dua, S.; Vermani, S. G.; Rajput, N.; Pani, B.	Biomedical Sciences	Frontiers in Environmental Science	2022	2296-665X	https://doi.org/10.3389/fenvs.2022.1022098	https://www.readcube.com/articles/10.3389/fenvs.2022.1022098	https://mjl.clarivate.com:/search-results?issn=2296-665X&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
533	**Evaluation of stigma receptivity and its properties in Helianthus annuus L. (Asteraceae).**	Sharma, B.**; Kalra, G.;** Verma, H.	Botany	Vegetos	2022	0970-4078	https://doi.org/10.1007/s42535-022-00419-x	https://link.springer.com/article/10.1007/s42535-022-00419-x	https://www.scopus.com/sourceid/19400157312	**SCOPUS INDEXED**
534	**Hydrotrope assisted green synthesis of dicoumarols and in silico and in vitro antibacterial, antioxidant and xanthine oxidase inhibition**	Mansi**, Khanna, P.;** Gupta, D.; Yadav, S.; Khanna, L.	Chemistry	Journal of Biomolecular structure and dynamics,	2022	1102 / 153	https://doi.org/10.1080/07391102.2022.2145368	https://pubmed.ncbi.nlm.nih.gov/36373290/	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**

535	**An understanding of coronavirus and exploring the molecular dynamics simulations to find promising candidates against the Mpro**	Singh, M. B.; Sharma, R.; Kumar, D.**; Khanna, P.;** Mansi; Khanna,	Chemistry	Journal of Infection and Public Health, 15, 1326–1349	2022	)341 / 187	https://doi.org/10.1016/j.jiph.2022.10.013	https://pubmed.ncbi.nlm.nih.gov/36288640/	https://mjl.clarivate.com:/search-results?issn=1876-0341&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
536	**UHPLC Analysis of Polycyclic aromatic hydrocarbons (PAH) compounds from the soil by QuEChERS AOAC method from Manesar industrial**	Singh, N.; Rani, P.; Tandon, N.**; Arya, D. K.;** Mahato, A.	Chemistry	J Microbiol Biotech Food Sci, 12(2) e5861.	2022	1338-5178	https://doi.org/10.55251/jmbfs.5861	https://office2.jmbfs.org/index.php/JMBFS/article/view/5861/3282	https://mjl.clarivate.com:/search-results?issn=1338-5178&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
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538	**Multicomponent synthetic strategies and perspectives for synthesis of linked or fused coumarin heterocycles.**	Pasricha, S.**; Mittal, K.;** Gahlot, P.; Kaur, H.; Avasthi, N.; Shweta	Chemistry	Journal of the Iranian Chemical Society, 19:4035–40	2022	1735-207X / 1735-2428	https://doi.org/10.1007/s13738-022-02603-x	https://link.springer.com/article/10.1007/s13738-022-02603-x	https://mjl.clarivate.com:/search-results?issn=1735-207X&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
539	**Entropy for item inclination in sub-community based recommender system.**	Ahuja, H.; Narang**, S,; Kaur, S.**; Saxena, R.	Electronics	International Journal of Advanced Technology and	2022	2215-0986	http://dx.doi.org/10.19101/IJATEE.2021.875768	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2022/8/4.pdf	https://mjl.clarivate.com:/search-results?issn=2215-0986&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
540	**Entropy for item inclination in sub-community based recommender system.**	Ahuja, H.; Narang**, S,; Kaur, S.**; Saxena, R.	Electronics	International Journal of Advanced Technology and	2022	2215-0986	http://dx.doi.org/10.19101/IJATEE.2021.875768	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2022/8/4.pdf	https://mjl.clarivate.com:/search-results?issn=2215-0986&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
541	**Entropy for item inclination in sub-community based recommender system.**	Ahuja, H.; Narang**, S,; Kaur, S.**; Saxena, R.	Electronics	International Journal of Advanced Technology and	2022	2215-0986	http://dx.doi.org/10.19101/IJATEE.2021.875768	https://www.accentsjournals.org/PaperDirectory/Journal/IJATEE/2022/8/4.pdf	https://mjl.clarivate.com:/search-results?issn=2215-0986&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
542	**Evaluation of Cost benefit Analysis using One-R Supervised Machine Learning Algorithm for Healthcare, https://doi.org/10.14754/nq.**	Kavitha, S**,; Prasad, N.S.; Samal, C. K.;** Hanumanthappa, H.	Computer Science	Neuro Quantology, 20(9) 6610-6615,	2022	1303 5150	https://doi.org/10.14754/nq.2022.20.9.NQ44773	https://www.neuroquantology.com/open-access/Evaluation+of+Cost+benefi		**SCOPUS INDEXED**

543	**Mildly reduced graphene oxide membranes for water purification applications.**	Kumar, S.; Garg, A.; **Chowdhuri, A.**	Physics	Nano Express 3, 045003.	2022	2632-959X	https://doi.org/10.1088/2632-959X/aca7d6	https://iopscience.iop.org/article/10.1088/2632-959X/aca7d6/pdf	https://mjl.clarivate.com:/search-results?issn=2632-959X&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
544	**Mildly reduced graphene oxide membranes for water purification applications.**	Kumar, S.; Garg, A.; **Chowdhuri, A.**	Physics	Nano Express 3, 045003.	2022	2632-959X	https://doi.org/10.1088/2632-959X/aca7d6	https://iopscience.iop.org/article/10.1088/2632-959X/aca7d6/pdf	https://mjl.clarivate.com:/search-results?issn=2632-959X&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
545	**Mildly reduced graphene oxide membranes for water purification applications.**	Kumar, S.; Garg, A.; **Chowdhuri, A.**	Physics	Nano Express 3, 045003.	2022	2632-959X	https://doi.org/10.1088/2632-959X/aca7d6	https://iopscience.iop.org/article/10.1088/2632-959X/aca7d6/pdf	https://mjl.clarivate.com:/search-results?issn=2632-959X&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
546	**An Inclusive Science Laboratory for Visually Impaired Students.**	**Ghai, G.;** Raj, R.; Kaur, R.	Electronics	Journal of Engineering Education Transformations, 36(2),	2022	3, eISSN 2	https://doi.org/10.16920/jeet/2022/v36i2/22157	file:///C:/Users/praga/Downloads/JEET_v36i2_October_2022%20-88-101.pdf	https://www.scopus.com/sourceid/21100890669	**SCOPUS INDEXED**
547	**An Inclusive Science Laboratory for Visually Impaired Students.**	Ghai, G.; Raj, R.**; Kaur, R.**	Electronics	Journal of Engineering Education Transformations, 36(2),	2022	3, eISSN 2	https://doi.org/10.16920/jeet/2022/v36i2/22157	https://journaleet.in/articles/an-inclusive-science-laboratory-for-visually-impaired-	https://www.scopus.com/sourceid/21100890669	**SCOPUS INDEXED**
548	**Flexible inventory system of imperfect production under deterioration and inflation.**	Sharma, A.**; Singh, C.;** Verma, P.; Malik, A. K.	Mathematics	Yugoslav Journal of Operations Research, 32(4), 515-	2022	0354-0243	https://doi.org/10.2298/YJOR220318025S	file:///C:/Users/praga/Downloads/FLEXIBLE_INVENTORY_SYSTEM_OF_IMPERFECT_PR	https://www.scopus.com/sourceid/23492	**SCOPUS INDEXED**
549	**Perturbed Robe's problem with charged bodies.**	Ansari, A. A.; Sahdev, S. K.; Kellil, R.**; Prasad, S. N.**	Mathematics	Romanian Astron. J. , 32(2), 83–94.	2022	5168 / 228	http://www.astro.ro/~roaj/32_2/2022_02_01.pdf	http://www.astro.ro/~roaj/32_2/2022_02_01.pdf	https://mjl.clarivate.com:/search-results?issn=1220-5168&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
550	**Behaviour of a variable mass infinitesimal body in the CR3BP with heterogeneous primary and finite straight segment secondary.**	Ansari, A. A.**; Yadav, B.**	Mathematics	Romanian Astron. J. 32(2), 113–125	2022	5168 / 228	https://ui.adsabs.harvard.edu/abs/2022RoAJ...32..113A/abstr	https://ui.adsabs.harvard.edu/abs/2022RoAJ...32..113A/abstract	https://mjl.clarivate.com:/search-results?issn=1220-5168&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**

551	**Effects of Mass Variation in the Collinear Perturbed Moulton-Copenhagen Configuration.**	Ansari, A. A.**; Yadav, B.**	Mathematics	International Journal of Analysis and Applications	2022	2291-8639	https://doi.org/10.28924/2291-8639-20-2022-44	https://etamaths.com/index.php/ijaa/article/view/2619	https://mjl.clarivate.com:/search-results?issn=2291-8639&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**
552	**The Implementation of the Pentagonal Fuzzy Number toward the Solution of the Fuzzy Inventory Model with Ramp Demand Function and**	**Arya, D. D.;** Prakash, S.; Boadh, R.; Chauhan, A.; Rajoria, Y. K.	Mathematics	Neuroquantology, 20(17), 115-124.	2022	1303 5150	https://doi.org/10.14704/Nq.2022.20.17.Nq88017	https://www.researchgate.net/publication/365712215_The_Implementation_of_the	–	**PEER REVIEWED**
553	**Optimal strategy for remanufacturing system of sustainable products with trade credit under uncertain scenario.**	Poswal, P.; Chauhan, A.**; Arya, D. D.**; Boadh, R.; Rajoria, Y. K.;	Mathematics	Materials Today: Proceedings, 69(2), 165-173.	2022	2214-7853	https://doi.org/10.1016/j.matpr.2022.08.303	https://www.sciencedirect.com/science/article/abs/pii/S2214785322054803	https://www.scopus.com/sourceid/21100370037	**Indexed in UGC Care List and SCOPUS**
554	**Space Dependent Study of Fast Neutron Spectra and Tritium Production Rate in a Fusion Reactor Blanket of Li_2O.**	**Bhatia, M .;** Gupta, S.	Physics	Indian Journal of Pure & Applied Physics, 60,	2022	0019-5596	https://www.doi.org/10.56042/ijpap.v60i10.65064	https://nopr.niscpr.res.in/bitstream/123456789/60669/1/IJPAP%2060%2810%29%2	https://www.scopus.com/sourceid/28036	**SCOPUS INDEXED**
555	**Effect of variation in glancing angle deposition on resistive switching property of WO3 thin films for RRAM devices.**	Lamichhane, S.; Sharma, S.; Tomar, M.; **Chowdhuri, A.**	Physics	J. Appl. Phys. 132, 134102.	2022	0021-8979	https://doi.org/10.1063/5.0103236	https://pubs.aip.org/aip/jap/article-abstract/132/13/134102/2837530	https://www.scopus.com/sourceid/28132	**SCOPUS INDEXED**
556	**Ensemble-based unsupervised machine learning method for membership determination of open clusters using**	Deb, S.; Baruah, A**.; Kumar S.**	Physics	MNRAS 515, 4685–4701.	2022	0035-8711 / 1365-2966	https://doi.org/10.1093/mnras/stac2116	https://academic.oup.com/mnras/article-abstract/515/4/4685/6653107?re	https://mjl.clarivate.com:/search-results?issn=0035-8711&hide_exact_match_fl=true&utm_sourc	**Web of Science**
557	**Two-photon Bound to Bound Transitions under Strong Screening Potential.**	**Joshi, R.**	Physics	hy. J. Plus, 13	2022	2190-5444	https://doi.org/10.1140/epjp/s13360-022-03224-2	https://link.springer.com/article/10.1140/epjp/s13360-022-03224-2	https://mjl.clarivate.com:/search-results?issn=2190-5444&hide_exact_match_fl=true&utm_sourc	**Web of Science**
558	**Theoretical analysis of relativistic energy corrections, partition function and thermodynamic properties of spherically**	**Joshi, R.;** Goyal, A.; Kumar, P.; Mohan, M.	Physics	Eur. Phy. J. D, 76:149.	2022	1434-6060 / 1434-6079	https://doi.org/10.1140/epjd/s10053-022-00484-6	https://link.springer.com/article/10.1140/epjd/s10053-022-00484-6	https://mjl.clarivate.com:/search-results?issn=1434-6060&hide_exact_match_fl=true&utm_sourc	**SCOPUS INDEXED**

559	**A novel RP-HPLC method for quantification of cholinesterase activity in human blood: An application for assessing**	Sinha, S. N.; Ungarala, R.; Kumar, D.; Sangaraju, R.; **Kumar, S.**	Zoology	PLoS ONE 17(12): e0279287.	2022	1932-6203	https://doi.org/10.1371/journal.pone.0279287	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9803206/pdf/pone.0279287.pdf	https://mjl.clarivate.com:/search-results?issn=1932-6203&hide_exact_match_fl=true&utm_sourc	**Web of Science**
560	**Morphological and physiological changes induced by Achyranthes aspera-mediated silver nanocomposites in Aedes**	**Sharma, A.;** Mishra, M.; Dagar, V. S.; Kumar, S.	Zoology	Front. Physiol. 13:1031285.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.1031285	https://www.frontiersin.org/articles/10.3389/fphys.2022.1031285/full#:~:text=The%	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=true&utm_sourc	**Web of Science**
561	**Morphological and physiological changes induced by Achyranthes aspera-mediated silver nanocomposites in Aedes**	Sharma, A.**; Mishra, M.;** Dagar, V. S.; Kumar, S.	Zoology	Front. Physiol. 13:1031285.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.1031285	https://www.frontiersin.org/articles/10.3389/fphys.2022.1031285/full#:~:text=The%	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=true&utm_sourc	**Web of Science**
562	**Morphological and physiological changes induced by Achyranthes aspera-mediated silver nanocomposites in Aedes**	Sharma, A.; Mishra, M.; Dagar, V. S.**; Kumar, S.**	Zoology	Front. Physiol. 13:1031285.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.1031285	https://www.frontiersin.org/articles/10.3389/fphys.2022.1031285/full#:~:text=The%	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=true&utm_sourc	**Web of Science**
563	**Morphological and physiological changes induced by Achyranthes aspera-mediated silver nanocomposites in Aedes**	Sharma, A.; Mishra, M.; Dagar, V. S.**; Kumar, S.**	Zoology	Front. Physiol. 13:1031285.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.1031285	https://www.frontiersin.org/articles/10.3389/fphys.2022.1031285/full#:~:text=The%	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=true&utm_sourc	**Web of Science**
564	**Docking-based virtual screening ascertaining β-sitosterol-induced alterations in the Helicoverpa armigera Hübner gut enzymes.**	**Mishra, M.;** Sharma, A.; Dagar, V.S.; Kumar, S.	Zoology	Journal of the Entomological Research	2022	2651-3579	https://doi.org/10.51963/jers.v24i2.2276	https://www.entomol.org/journal/index.php/JERS/article/view/2276	https://mjl.clarivate.com:/search-results?issn=2651-3579&hide_exact_match_fl=true&utm_sourc	**Web of Science**
565	**Docking-based virtual screening ascertaining β-sitosterol-induced alterations in the Helicoverpa armigera Hübner gut enzymes.**	Mishra, M.**; Sharma, A.;** Dagar, V.S.; Kumar, S.	Zoology	Journal of the Entomological Research	2022	2651-3579	https://doi.org/10.51963/jers.v24i2.2276	https://www.entomol.org/journal/index.php/JERS/article/view/2276	https://mjl.clarivate.com:/search-results?issn=2651-3579&hide_exact_match_fl=true&utm_sourc	**Web of Science**
566	**Docking-based virtual screening ascertaining β-sitosterol-induced alterations in the Helicoverpa armigera Hübner gut enzymes.**	Mishra, M.; Sharma, A.; Dagar, V.S.; **Kumar, S.**	Zoology	Journal of the Entomological Research	2022	2651-3579	https://doi.org/10.51963/jers.v24i2.2276	https://www.entomol.org/journal/index.php/JERS/article/view/2276	https://mjl.clarivate.com:/search-results?issn=2651-3579&hide_exact_match_fl=true&utm_sourc	**Web of Science**

567	**Docking-based virtual screening ascertaining β-sitosterol-induced alterations in the Helicoverpa armigera Hübner gut enzymes.**	Mishra, M.; Sharma, A.; Dagar, V.S.; **Kumar, S.**	Zoology	Journal of the Entomological Research	2022	2651-3579	https://doi.org/10.51963/jers.v24i2.2276	https://www.entomol.org/journal/index.php/JERS/article/view/2276	https://mjl.clarivate.com:/search-results?issn=2651-3579&hide_exact_match_fl=true&utm_sourc	**Web of Science**
568	**An overview on non-Apis bees vis-à-vis the exploration of integrated taxonomic approach (Hymenoptera: Apoidea).**	Falswal, J.; Dey, D.; **Kumar, S.**	Zoology	Fragmenta entomologica, 54 (2): 233–246	2022	0429-288X / 2284-4880	DOI: 10.13133/2284-4880/703	https://www.researchgate.net/publication/366325617_An_overview_on_non-	https://mjl.clarivate.com:/search-results?issn=0429-288X&hide_exact_match_fl=true&utm_sourc	**Web of Science**
569	**Metabolic detoxification and ace-1 target site mutations associated with acetamiprid resistance in Aedes aegypti L.**	Samal, R. R.; Panmei, K.; Lanbiliu, P.; **Kumar, S.**	Zoology	Front. Physiol. 13:988907.	2022	1664-042X	https://doi.org/10.3389/fphys.2022.988907	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9468370/pdf/fphys-13-988907.pdf	https://mjl.clarivate.com:/search-results?issn=1664-042X&hide_exact_match_fl=true&utm_sourc	**Web of Science**
570	**Evidence of breeding of Jamides Bochus (Stoll, [1782]) (Insecta: Lepidoptera: Lycaenidae) in New Delhi, India**	**Chaudhary, R.;** Kumar, V**.**	Biomedical Science	Bionotes, 24, 252-253.	2022	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	**Web of Science**
571	**Sighting of Ruddy Meadow Skimmer Neurothemis Intermedia (Rambur 1842) (Insecta: Odonata:Libellulidae) in New**	**Chaudhary, R.**	Biomedical Science	Bionotes, 24, 254-256	2022	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	**Web of Science**
572	**Ovipositing record of Tailless Lineblue Prosotas Dubiosa , (Semper |1897|) (Insecta: Lepidoptera : Lycaenidae) from the vicinity of Delhi**	**Chaudhary, R.**	Biomedical Science	Bionotes, 24, 260-261	2022	0972-1800	https://entosocindia.org/image/catalog/bionotes/Bionotes%2	https://entosocindia.org/image/catalog/bionotes/Bionotes%20pdf%20papers/Vol.%20	https://mjl.clarivate.com:/search-results?issn=0972-1800&hide_exact_match_fl=true&utm_sourc	**Web of Science**
573	**Arbuscular mycorrhizal fungi and host plant relationship with respect to heavy metal remediation of soil.**	Gulati. S.; **Narang, A.;** Shukla, A.; Katyal, R.; Mathur, R.; Kaur,	Botany	Kavaka, 58(3), 61-74	2022	0379-5179	https://www.doi.org/10.36460/Kavaka/58/3/2022/61-74	https://www.researchgate.net/publication/365431747_Arbuscular_Mycorrhizal_Fun	_	**UGC CARE**
574	**Arbuscular mycorrhizal fungi and host plant relationship with respect to heavy metal remediation of soil.**	Gulati. S.; **Narang, A.;** Shukla, A.; Katyal, R.; Mathur, R.; Kaur,	Botany	Kavaka, 58(3), 61-74	2022	0379-5179	https://www.doi.org/10.36460/Kavaka/58/3/2022/61-74	https://www.researchgate.net/publication/365431747_Arbuscular_Mycorrhizal_Fun	_	**UGC CARE**

575	**Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from**	Saya, L.; **Hooda, S.;** Singh, R. W.	Chemistry	International journal of innovative research in technology,	2022	2349-6002	https://ijirt.org/master/publishedpaper/IJIRT157412_PAPER.	https://ijirt.org/master/publishedpaper/IJIRT157412_PAPER.pdf	https://mjl.clarivate.com:/search-results?issn=1996-6814&hide_exact_match_fl=true&utm_sourc	**PEER REVIEWED**
576	**Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from**	Saya, L.; **Hooda, S.;** Singh, R. W.	Chemistry	International journal of innovative research in technology,	2022	2349-6002	https://ijirt.org/master/publishedpaper/IJIRT157412_PAPER.	https://ijirt.org/master/publishedpaper/IJIRT157412_PAPER.pdf	https://mjl.clarivate.com:/search-results?issn=1996-6814&hide_exact_match_fl=true&utm_sourc	**PEER REVIEWED**
577	**Bibliometric Analysis of Peer-Reviewed Literature on Stress Factors Affecting Agricultural Productivity.**	Sisodia, R.; **Sharma, R.**	Botany	Current Agriculture Research Journal, 10(3), 170-	2022	2347-4688	http://dx.doi.org/10.12944/CARJ.10.3.02	https://www.agriculturejournal.org/volume10number3/bibliometric-analysis-of-peer-	_	**UGC CARE**
578	**Impact of Covid-19 on Corporate Social Responsibility: A Study of Indian IT Sector.**	**Goel, S. K,**; Jain, S.	Commerce	Journal of Commerce and Management, 9(2), 101-	2022	2347-4440	https://doi.org/10.17492/jpi.manthan.v9i2.922206	https://www.indianjournals.com/ijor.aspx?target=ijor:mjcm&volume=9&issue=2&artic	_	**PEER REVIEWED**
579	**Phool: Journey from waste to wealth**	**Kaur, S.;** Bhagat, H.; Kaur, P.N	Commerce	Arthavaan, 5, 65-74.	2022	2455-0353	https://www.bharaticollege.du.ac.in/images/media/IM-6509-	_	_	**PEER REVIEWED**
580	**Phool: Journey from waste to wealth**	**Kaur, S.;** Bhagat, H.; Kaur, P.N	Commerce	Arthavaan, 5, 65-74.	2022	2455-0353	https://www.bharaticollege.du.ac.in/images/media/IM-6509-	_	_	**PEER REVIEWED**
581	**Phool: Journey from waste to wealth**	**Kaur, S.;** Bhagat, H.; Kaur, P.N	Commerce	Arthavaan, 5, 65-74.	2022	2455-0353	https://www.bharaticollege.du.ac.in/images/media/IM-6509-	_	_	**PEER REVIEWED**
582	**A Simulation-based Approach to Evaluate and Regulate the Reputation Score of a Software Agent in E-Market.**	Kochhar, S. K.; Soni, A.; Srivastava, S.; **Gaur, V.**	Computer Science	International Journal of Next-Generation Computing,	2022	0976-5034	https://doi.org/10.47164/ijngc.v13i3.788	https://ijngc.perpetualinnovation.net/index.php/ijngc/article/view/788	_	**PEER REVIEWED**

583	**Study the Effect of Modified Newtonian Force on the Restricted 3-body Configuration in Non-Linear Sense.**	Singh B.; Kumari, S.; **Prasad, S. N.**	Mathematics	Applications and Applied Mathematics: An Internation	2022	1932-9466	https://digitalcommons.pvamu.edu/aam/vol17/iss2/10/	https://digitalcommons.pvamu.edu/aam/vol17/iss2/10/	https://mjl.clarivate.com:/search-results?issn=1932-9466&hide_exact_match_fl=true&utm_sourc	**Web of Science**
584	**Measuring complexity and chaos in three species food chain system with the Beddington-Deangelis functional response.**	**Prasad, S. N.;** Saha, L. M.; Ansari, A. A.	Mathematics	Bulletin of the Allahabad mathematical society,	2022	0273-0979 / 1088-9485				**PEER REVIEWED**
585	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population.**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; Chauhan, B.;	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_E	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
586	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population,**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; **Chauhan, B.**;	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_E	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
587	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population,**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; **Chauhan, B.**;	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_E	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
588	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population,**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; **Chauhan, B.**;	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_E	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
589	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population,**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; **Chauhan, B.**;	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_E	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
590	**Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population,**	Sneha, S.; Pranav; Shivam; Neha, R.; Vashishtha, K.; **Chauhan, B.**;	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.082	https://www.researchgate.net/publication/365233609_Post_COVID-19_Long_Term_E	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**

591	**Re-characterization of Potential Zoonotic Trematode Parasite Parasitizing Intestine of Snakehead Fish, (Channa**	Chauhan, B.**; Misra, M.;** Sharma, B.	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.059	https://www.researchgate.net/publication/364126895_Re-characterization_	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
592	**Re-characterization of Potential Zoonotic Trematode Parasite Parasitizing Intestine of Snakehead Fish, (Channa**	Chauhan, B.**;** Misra, M.**; Sharma, B.**	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.059	https://www.researchgate.net/publication/364126895_Re-characterization_	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
593	**Impact of Climatic Change on Respiratory Health.**	Jain, R.; Aryama, P.; **Chauhan, B.;** Misra, M.**;** Saxena, T.	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.115	https://www.researchgate.net/publication/366684164_Impact_of_climatic_change_o	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
594	**Impact of Climatic Change on Respiratory Health.**	Jain, R.; Aryama, P.; Chauhan, B.**; Misra, M.;** Saxena, T.	Zoology	International Journal of Zoological Investigations, 8(2),	2022	2454-3055	https://doi.org/10.33745/ijzi.2022.v08i02.115	https://www.researchgate.net/publication/366684164_Impact_of_climatic_change_o	https://mjl.clarivate.com:/search-results?issn=2454-3055&hide_exact_match_fl=true&utm_sourc	**Web of Science**
595	**PCR primer design for mitochondrial cox-1 gene from Clinostomum complanatum towards diagnosis.**	**Misra, M.;** Chauhan, B.; Km, D.; Madhuri, A,; Sharma, B.	Zoology	Bioinformation 18(9), 831-833.	2022	0973-2063	https://doi.org/10.6026/97320630018831	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10326325/pdf/97320630018831.pdf	_	**PEER REVIEWED**
596	**PCR primer design for mitochondrial cox-1 gene from Clinostomum complanatum towards diagnosis.**	Misra, M.**; Chauhan, B.**; Km, D.; Madhuri, A,; Sharma, B.	Zoology	Bioinformation 18(9), 831-833.	2022	0973-2063	https://doi.org/10.6026/97320630018831	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10326325/pdf/97320630018831.pdf	_	**PEER REVIEWED**
597	**A Literature Review on Reckless and Hazardous Contraceptive Practices used since Primeval Times.**	**Chauhan, B.; Misra, M.;**	Zoology	Indian Journal of Natural Sciences, 13, 44976-	2022	0976-0997	https://www.researchgate.net/publication/362540479_A_Lit	https://www.researchgate.net/publication/362540479_A_Literature_Review_on_Rec	https://mjl.clarivate.com:/search-results?issn=0976-0997&hide_exact_match_fl=true&utm_sourc	**Web of Science**
598	**A Literature Review on Reckless and Hazardous Contraceptive Practices used since Primeval Times,**	Chauhan, B.**; Misra, M.;**	Zoology	Indian Journal of Natural Sciences, 13, 44976-	2022	0976-0997	https://www.researchgate.net/publication/362540479_A_Lit	https://www.researchgate.net/publication/362540479_A_Literature_Review_on_Rec	https://mjl.clarivate.com:/search-results?issn=0976-0997&hide_exact_match_fl=true&utm_sourc	**Web of Science**

599	**Role of A Evolutionary Conserved Hypothalamic Neuropeptide: Neuropeptide Y (NPY) in Release of Gonadotropin and Anterior**	**Chauhan, B.;** Baweja, V.; Misra, M.;	Zoology	Indian Journal of Natural Sciences, 13, 48415-	2022	0976-0997	https://www.researchgate.net/publication/364310786_Role	https://www.researchgate.net/publication/364310786_Role_of_A_Evolutionary_Cons	https://mjl.clarivate.com:/search-results?issn=0976-0997&hide_exact_match_fl=true&utm_sourc	**Web of Science**
600	**Role of A Evolutionary Conserved Hypothalamic Neuropeptide: Neuropeptide Y (NPY) in Release of Gonadotropin and Anterior**	Chauhan, B.; Baweja, V.**; Misra, M.;**	Zoology	Indian Journal of Natural Sciences, 13, 48415-	2022	0976-0997	https://www.researchgate.net/publication/364310786_Role	https://www.researchgate.net/publication/364310786_Role_of_A_Evolutionary_Cons	https://mjl.clarivate.com:/search-results?issn=0976-0997&hide_exact_match_fl=true&utm_sourc	**Web of Science**
601	**Monkeypox: Endemic to Epidemic A review of the current scenario of Monkeypox disease outbreak.**	Thakur, M.; **Bhardwaj, S.**; Singh, J.	Zoology	International Journal for Research Trends and	2022	2456-3315	https://ijrti.org/papers/IJRTI2206295.pdf	https://ijrti.org/papers/IJRTI2206295.pdf	https://mjl.clarivate.com:/search-results?issn=2386-4303&hide_exact_match_fl=true&utm_sourc	**Web of Science**
602	**In vitro micropropagation of *Acacia holosericea* a. cunn. ex g. don through cotyledons.**	**Narang, A.**	Botany	Intl. J. Multidisc. Edu. Res, 11(7), 70-75	2022	2277-7881	http://ijmer.in.doi./2022/11.01.135	http://s3-ap-southeast-1.amazonaws.com/ijmer/pdf/volume11/volume11-	_	**PEER REVIEWED**
603	**Axenic propagation of a woody legume - Prosopis cineraria (L.) Duce through cotyledonary node explants**	**Narang, A**. and Shukla, A.	Botany	Intl. J. Multidisc. Edu. Res, 11(2), 16-21	2022	2277-7881	http://ijmer.in.doi./2022/11.02.03	http://s3-ap-southeast-1.amazonaws.com/ijmer/pdf/volume11/volume11-	_	**PEER REVIEWED**
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605	**Linkages Between Credit Cards and Consumers' Impulsive Buying Behavior: An Empirical Analysis.**	Singh, A. K.**, Goel, S. K.,** Shrivastav, R. K., and Chahar, K.	Commerce	Arthshastra Indian Journal of Economics and	2022	2278 - 181	10.17010/aij	https://indianjournalofeconomicsandresearch.com/index.php/aijer/article/view/168	_	**PEER REVIEWED**
606	**Antibiotic Resistance: A Global Health Crisis**	Solanki, R., Anand, S., Anand, M., Kumar, P., Kumar, M. and	Zoology	Biosphere, 1: 1-70, Pg 3-11.	2022					**PEER REVIEWED**

607	**Antibiotic Resistance: A Global Health Crisis**	Solanki, R., Anand, S., Anand, M., Kumar, P., Kumar, M. and	Zoology	Biosphere, 1: 1-70, Pg 3-11.	2022					**PEER REVIEWED**
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610	**Role of abiotic and biotic components in remediating environmental pollutants: A review**	Somasundaram, S., Dagar, J., Abraham, J. S., Maurya, S., Sandeep,	Zoology	Microsphere, 1: 1-70, Pg 49-60	2022	2583-5327	10.59118/SDBZ7071	https://www.researchgate.net/publication/369178502_Role_of_abiotic_and_biotic_c	_	**PEER REVIEWED**
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616	**Implementation of an Adaptive Artificial Neural Network with Fuzzy Expert System for Diagnoses the Breast and Prostate Cancer:**	Kaur K., Prasad J.S**., Aarya D.D.**, Krishna H., Tambe V.B., Rajoria Y.K.,	Mathematics	Journal of Pharmaceutical Negative Results, 13,	2022	0976-9234	https://doi.org/10.47750/pnr.2022.13.S08.475	https://www.pnrjournal.com/index.php/home/article/view/5595	–	Peer Reviewed
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620	**In silico prediction of natural compounds as potential multi-target inhibitors of structural proteins of SARS-CoV-2.**	Rani J., Bhargav A., Khan F.I., Ramachandran S., Lai D**., Bajpai U.**	Biomedical Science	Journal of Biomolecular Structure and Dynamics,	2022	0739-1102 / 1538-0254	10.1080/07391102.2021.1968497	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8425474/pdf/TBSD_0_1968497.pdf	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	SCOPUS INDEXED
621	**In silico prediction of natural compounds as potential multi-target inhibitors of structural proteins of SARS-CoV-2.**	Rani J., Bhargav A., Khan F.I., Ramachandran S., Lai D**., Bajpai U.**	Biomedical Science	Journal of Biomolecular Structure and Dynamics,	2022	0739-1102 / 1538-0254	10.1080/07391102.2021.1968497	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8425474/pdf/TBSD_0_1968497.pdf	https://mjl.clarivate.com:/search-results?issn=0739-1102&hide_exact_match_fl=true&utm_sourc	SCOPUS INDEXED
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628	**Genome-based reclassification of amycolatopsis eurytherma as a later heterotypic synonym of amycolatopsis**	**Singh P.**, Hira P., Rawat C.D., Lal R., Sood U.	Zoology	International Journal of Systematic and Evolutionar	2021	1466-5026	10.1099/ijsem.0.004642	https://pubmed.ncbi.nlm.nih.gov/33470925/	https://www.scopus.com/sourceid/19761	SCOPUS INDEXED
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633	**Computational identification and characterization of antigenic properties of Rv3899c of Mycobacterium tuberculosis and its**	Das R., Eniyan K., **Bajpai U.**	Biomedical Science	Immunogenetics, 73 (5), pp. 357 - 368	2021	0093-7711	10.1007/s00251-021-01220-x	https://pubmed.ncbi.nlm.nih.gov/34228167/	https://www.scopus.com/sourceid/22271	SCOPUS INDEXED
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636	**PGPR-mediated induction of systemic resistance and physiochemical alterations in plants against the pathogens: Current perspectives**	Meena M.**, Swapnil P.,** Divyanshu K., Kumar S., Harish, Tripathi Y. N.,	Botany	Journal of Basic Microbiology, 60 (10), pp. 828 -	2020	0233-111X	https://doi.org/10.1002/jobm.202000370	https://onlinelibrary.wiley.com/doi/epdf/10.1002/jobm.202000370	https://www.scopus.com/sourceid/20221	SCOPUS INDEXED
637	**Recyclable Organocatalyst for One-Pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone**	Liu M., Zhang X., Huang X., **Dhawan G.**, Evans J., Kaur M., Jasinski J.P.,	Biomedical Science	European Journal of Organic Chemistry, 2019 (1),	2019	1434-193X	10.1002/ejoc.201801480	https://chemistry-europe.onlinelibrary.wiley.com/doi/10.1002/ejoc.201801480	https://www.scopus.com/sourceid/25853	SCOPUS INDEXED
638	**A modified intuitionistic fuzzy c-means clustering approach to segment human brain MRI image.**	Kumar D., **Verma H.,** Mehra A., Agrawal R.K.	Mathematics	Multimedia Tools and Applications, 78 (10), pp. 12663 -	2019	1380-7501	10.1007/s11042-018-5954-0	https://dl.acm.org/doi/abs/10.1007/s11042-018-5954-0	https://www.scopus.com/sourceid/25627	SCOPUS INDEXED

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640	**Fe doped BaTiO3 sensitized by Fe3O4 nanoparticles for improved photoelectrochemical response.**	Upadhyay R.K., **Sharma D.**	Electronics	Materials Research Express, 5 (1), art. no. 015913	2018	2053-1591	10.1088/2053-1591/aaa7d8	https://iopscience.iop.org/article/10.1088/2053-1591/aaa7d8/pdf	https://www.scopus.com/sourceid/21100432452	SCOPUS INDEXED
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From the journal:
Green Chemistry

One-pot and catalyst-free synthesis of pyrroloquinolinediones and quinolinedicarboxylates †

Xiaofeng Zhang ,[a] Gagan Dhawan ,[ab] Alex Muthengi ,[a] Shuai Liu ,[a] Wei Wang ,[c] Marc Legris [a] and Wei Zhang [*a]

Author affiliations

Abstract

A method for the catalyst-free synthesis of pyrroloquinolinediones and quinolinedicarboxylates is developed through a one-pot synthesis involving denitrogenation of azide, benzisoxazole formation, aza-Diels–Alder cycloaddition, and dehydrative aromatization. Only stoichiometric amounts of N_2 and H_2O are produced as by-products. A comprehensive green chemistry metrics analysis indicated that this method is much more efficient and greener than two reported methods for the synthesis of pyrroloquinolinediones.

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A robust replenishment model for deteriorating items considering ramp-type demand and inflation under fuzzy environment

Archana Sharma, Usha Sharma and Chaman Singh

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ABOUT

Abstract

Supply chain performance directly depends on demand pattern, inventory management and control strategies of organisations apart from other supply chain activities. Effective replenishment policy can increase the performance of logistics and supply chain activities and customer satisfaction. Optimal inventory model can also reduce overall replenishment cost and improve financial performance of the organisation. This study focuses on developing a replenishment model for deteriorating products with ramp-type demand rate under the consideration of inflation and partial backlogging. The nature of the demand function is a piecewise exponential function. The proposed model is developed under fuzzy environment, which can easily handle uncertainty and impreciseness associated with parameters. The illustrative numerical example has given in crisp as well as in fuzzy sense to demonstrate the solution procedure for the proposed approach. Sensitivity analysis is also performed to check the robustness of the proposed model.

Keywords

supply chain, inventory model, ramp-type demand rate, inflation, partial backlogging, fuzzy

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Supply Chain Model with Two Storage Facility for Stock Dependent Demand Incorporating Learning and Inflationary Effect under Crisp and Fuzzy Environment

Chaman Singh, Shiv R. Singh

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Abstract

In this paper, a supply chain model with power form stock-dependent demand rate is developed, incorporating the effect of learning and inflationary environment. In order to bring their research closer to reality, all the cost parameters involved in the model are considered fuzzy in nature. The demand rate is assumed to be a polynomial form of current inventory level in Own-warehouse. To display the items, retailer has one warehouse of finite capacity, treated as own warehouse (OW) and may hire another warehouse of large capacity, treated as rented warehouse (RW) to storage the excess inventory. Learning effect is incorporated on retailer's selling price, purchasing cost, part of holding cost, deterioration cost and ordering cost. Proposed model is illustrated with some numerical example along with sensitivity analysis of parameters.

Acta Ecologica Sinica

Volume 38, Issue 5, October 2018, Pages 325-328

Inhibition of gut proteases and development of dengue vector, *Aedes aegypti* by *Allium sativum* protease inhibitor

Tooba Naz Shamsi [a], Romana Parveen [a], Afaque Ahmad [b], Roopa Rani Samal [c], Sarita Kumar [c], Sadaf Fatima [a]

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Abstract

The paper describes the bio efficacy of a protease inhibitor; isolated from *Allium sativum* '*garlic*' (ASPI); against Aedes aegypti mosquito, a well-known transmitter of dengue and Chikungunya. The purification of protease inhibitor from *Allium sativum* '*garlic*' (ASPI) was carried out by ammonium sulfate precipitation followed by Fast Protein Liquid Chromatography using akta DEAE-Cellulose column. The protein fraction demonstrating trypsin inhibitory activity was further evaluated for its insecticidal activity using gut protease inhibition assay and larvicidal assay. ASPI is an inhibitor of porcine trypsin (IC_{50} of 650.726 μg/mL) and has molecular weight of ~15 kDa determined by SDS PAGE similar to other inhibitors of the Kunitz-type family (14–26 kDa). ASPI demonstrated 50% reduced activity of *Ae. aegypti* midgut proteases and showed a dose-dependent acute toxicity on *Ae. aegypti* 3rd instars exhibiting LC_{50} value of ~50.827 μg/mL. After ten days of larval exposure ASPI resulted in a 24-h delay of larval development and ~72% mortality at 61.5 μg/mL. These results suggest that ASPI may serve as potent insecticida

Original Article | Published: 24 June 2017

Assessment of *Achyranthes aspera* induced toxicity and molecular analysis of RAPD-PCR profiles of larval genomic DNA of *Aedes aegypti* L. (Diptera: Culicidae)

Aarti Sharma, Sarita Kumar & Pushplata Tripathi

Journal of Parasitic Diseases **41**, 1066–1073 (2017) | Cite this article

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Abstract

Current studies investigated the anti-mosquito potential of *Achyranthes aspera* against the dengue vector, *Aedes aegypti*. The stems and leaves of *A. aspera* were extracted in hexane and evaluated for their toxicity against early fourth instars of *A. aegypti*. The larvicidal efficacy of the extract was validated as per WHO protocol. The mortality counts were made after 24 h and LC values were calculated at different levels. The adverse impact of extracts was also explored on the larval genomic DNA. The larvae were exposed to extracts at LC_{50} levels and the alterations in *g*-DNA was evaluated through RAPD-PCR technique using three random primers; MA-09, MA-12 and MA-26. Our investigations ascertained the larvicidal efficacy of both the leaf and stem extracts of *A. aspera* resulting in respective LC_{50} values of 0.068 and 0.082 mg/mL. The extracts also caused variable genotoxic effects with significant changes in the RAPD profiles. The results showed appreciable modifications in larval *g*-DNA with loss of certain bands and gain of unique bands with 82.35% DNA polymorphism. These alterations suggest the probable DNA damage and mutations in the larval *g*-DNA caused by certain phytocomponents which could be the possible reason of larval mortality. Our studies evidenced the anti-mosquito potential of *A. aspera* extracts against *A. aegypti* causing appreciable larval mortality and significant changes in *g*-DNA. The *A. aspera* extracts are suggested as efficient and eco-friendly control agent against *A. aegypti*, yet further investigations are needed to identify the bioactive constituent and ascertain its effectiveness in the field conditions.

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Aarti Sharma [a], Sarita Kumar [b], Pushplata Tripathi [a]

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Abstract

Aedes aegypti L. is the primary vector associated with transmission of globally concerned diseases; Zika, yellow fever, dengue and Chikungunya. Present study investigates an efficient, alternative and comparative approach for mosquito control which is safe to environment and non-target organisms. The silver nano-composites (AgNCs) were synthesized from the aqueous stem extract of *Achyranthes aspera* (AASE) using different concentration of aqueous silver nitrate ($AgNO_3$). The synthesis was tracked by UV-vis spectrophotometer and particle size analyser (DLS). The evaluation of their larvicidal potential against early fourth instars of *Ae. aegypti* showed significant potency, the toxicity increasing with the concentration of silver nitrate. The 24, 48 and 72 h bioassays resulted in respective LC_{50} values of 26.693, 1.113 and 0.610 µg/mL (3 mM AASE-$AgNO_3$) 9.119, 0.420 and 0.407 µg/mL (4 mM AASE-$AgNO_3$) and that of 4.283, 0.3 and 0.248 µg/mL (5 mM AASE-$AgNO_3$). Keeping in view the significantly high larvicidal efficiency at lower concentration of silver nitrate, the 4 mM nano-composites were selected over 5 mM composites for further biophysical characterization carried out by X-ray Diffraction (XRD), Fourier transform infrared spectrometer (FTIR), Scanning electron microscopy (SEM), Energy dispersive X-ray (EDX) spectroscopy and Transmission electron microscopy (TEM). SEM and TEM confirmed the synthesis of spherical poly-dispersed AgNCs with average size ranging from 1–30 nm. Characterization through XRD showed the crystalline face-centered-cubic (fcc) structure of AgNCs with the highest intense peak obtained at 2θ value of 31.82°. FT-IR data suggests complex nature of AgNCs showing clearly defined peaks in different ranges. The present investigations recommend AgNCs of *A. aspera* stems as a low-cost and eco-friendly alternative to chemical insecticides for mosquito control.

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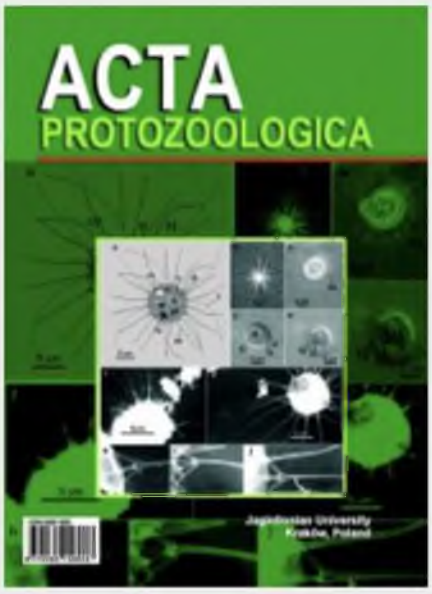

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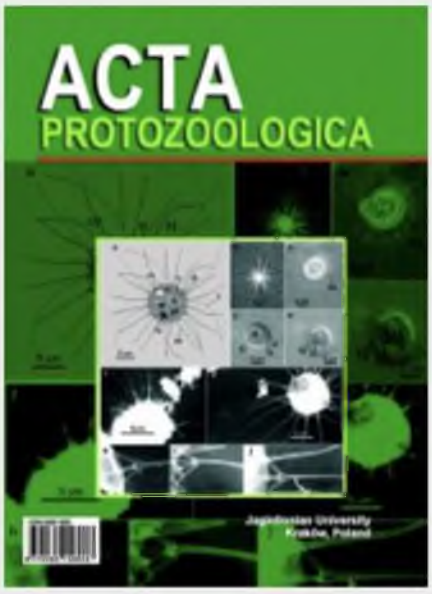

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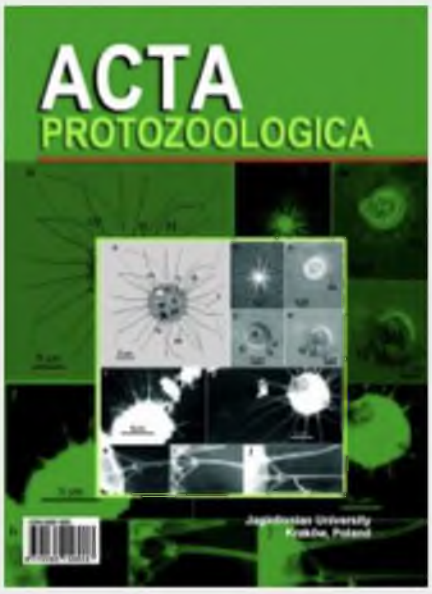

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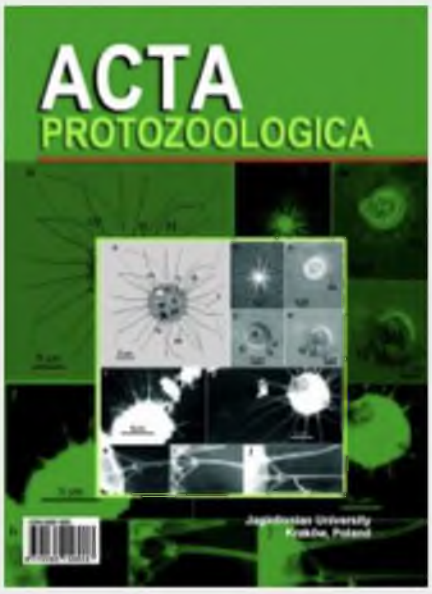

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HAYATI Journal of Biosciences
Volume 24, Issue 4, October 2017, Pages 215-220

Original Research Article

Diversity and Abundance of Ammonia-Oxidizing Bacteria and Archaea in a Freshwater Recirculating Aquaculture System

Cherita Devi Khangembam [1], Jai Gopal Sharma [2], Rina Chakrabarti [1]

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Abstract

The role of ammonia-oxidizing bacteria and archaea was evaluated using *amoA* gene in a freshwater recirculating system. Broken earthen pot pieces (BEP) were used as filter bed material. Five archaeal and four bacterial operational taxonomic units were retrieved from *amoA* genes. Shannon-Weiner and Simpson indices were higher in archaeal *amoA* sequence compared with the bacteria. Subtype diversity ratio and subtype diversity variance were 0.522 and 0.008, respectively, for archaea and 0.403 and 0.015, respectively, for bacteria. In archaea, 50% *amoA* sequences showed 99%–100% similarity with the known sequences of ammonia monooxygenase subunit A of uncultured archaeon clones and thaumarchaeote. In bacteria, 84% sequences showed 99% similarity with *amoA* sequences of different uncultured bacterial clone and Nitrosomonadaceae. Absolute quantification showed that the abundance of archaea was 12-fold higher compared with bacteria. In this recirculating system, ammonia-oxidizing archaea and bacteria played a major role; BEP supported the growth of these ammonia-oxidizing microorganisms.

Journal of Eukaryotic Microbiology / Volume 64, Issue 4 / p. 539-554

Original Article | Open Access

Beyond the "Code": A Guide to the Description and Documentation of Biodiversity in Ciliated Protists (Alveolata, Ciliophora)

Alan Warren, David J. Patterson, Micah Dunthorn, John C. Clamp, Undine E.M. Achilles-Day, Erna Aescht, Saleh A. Al-Farraj, Saleh Al-Quraishy, Khaled Al-Rasheid, Martin Carr, John G. Day ... See all authors

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Citations: 87

Affiliations are listed at the end.

Abstract

Recent advances in molecular technology have revolutionized research on all aspects of the biology of organisms, including ciliates, and created unprecedented opportunities for pursuing a more integrative approach to investigations of biodiversity. However, this goal is complicated by large gaps and inconsistencies that still exist in the foundation of basic information about biodiversity of ciliates. The present paper reviews issues relating to the taxonomy of ciliates and presents specific recommendations for best practice in the observation and documentation of their biodiversity. This effort stems from a workshop that explored ways to implement six Grand Challenges proposed by the International Research Coordination Network for Biodiversity of Ciliates (IRCN-BC). As part of its commitment to strengthening the knowledge base that supports research on biodiversity of ciliates, the IRCN-BC proposes to populate *The Ciliate Guide*, an online database, with biodiversity-related data and metadata to create a resource that will facilitate accurate taxonomic identifications and promote sharing of data.

THE nomenclature of ciliates and other heterotrophic protists (sensu Adl et al. 2012) is governed by the International Code of Zoological Nomenclature ("the Code") that provides rules for naming taxa up to the level of family (ICZN 1999). The Code regulates nomenclatural issues, and it also establishes minimal standards for documenting newly described species. These are deliberately general and suited more to the study of animals than protists. In particular, the rule to deposit type specimens in permanently curated repositories (ICZN 1999, Art. 16.4.2 and Art. 75.3.7) has, over time, generated a database of material that not only has fixed names but also has formed the nucleus of large museum collections. These collections provide a wealth of information about the variability and biogeography of species and represent a potential source of DNA for investigations of molecular phylogenetics.

For ciliates and many other protists, the logistical difficulties imposed by their small size meant there was no convention for depositing type specimens until the latter part of the 20th century, when deposition of permanently stained preparations or other physical specimens (e.g. on SEM stubs) began to be required as type material for taxonomic descriptions or redescriptions. In addition, new methods of visualizing morphology and sequencing genes have been introduced over the last several decades, but there are no formal standards for application of these methods to taxonomic identifications or descriptions of ciliates, despite recent recommendations (Aescht 2001, 2008; Foissner 2002; ICZN 1999; Lynn and Simpson

Assessment of heavy metal toxicity in four species of freshwater ciliates (Spirotrichea: Ciliophora) from Delhi, India

Jeeva Susan Abraham[1], S. Sripoorna[1], Ashish Choudhary[1], Ravi Toteja[1], Renu Gupta[2], Seema Makhija[1,*] and Alan Warren[3]

[1]Acharya Narendra Dev College, University of Delhi, Delhi 110 019, India
[2]Maitreyi College, University of Delhi, Delhi 110 021, India
[3]Department of Life Sciences, Natural History Museum, London, SW7 5BD, UK

In vitro **laboratory experiments were conducted to determine the toxicity (per cent survival and LC_{50}) of essential and non-essential heavy metals (cadmium, copper, nickel, lead and zinc) in four spirotrich ciliates: *Euplotes* sp., *Notohymena* sp., *Pseudourostyla* sp. and *Tetmemena* sp. isolated from three different freshwater ecosystems in the Delhi region, India. The toxicity of the heavy metals was found to vary among the different ciliates. Copper was most toxic (24 h-LC_{50} value ranged between 0.125 and 0.74 mg/l) and zinc was least toxic (24 h LC_{50} value ranged between 46.98 and 144.32 mg/l) to each of the ciliates. Of the four ciliates, *Notohymena* sp. had the highest tolerance limit to three heavy metals (Cu, Cd and Pb) out of the five tested. This study shows the high potentiality of using freshwater ciliates for monitoring the intensity and potency of ecological damage caused by heavy metals in aquatic ecosystems.**

Keywords: Ciliates, freshwater, heavy metals, toxicity.

THERE is a global increase in the concentration of heavy metals in the environment mainly due to anthropogenic activities and India is no exception to this[1]. Although some heavy metals are essential micronutrients, all may be toxic if present in sufficiently high concentration in a bioavailable form, mainly as a result of metabolic interference and mutagenesis. The presence of heavy metals in aquatic environments is a major concern because of their threat to plant and animal life, thus disturbing the natural ecological balance[2]. Many freshwater ecosystems, including lakes, ponds, rivers and reservoirs are exposed to heavy metal contamination from a range of sources, primarily wastewater discharges from industry and households[3,4]. Most of the heavy metals have a long half-life and cannot be degraded, but may instead bio-accumulate throughout the food chain leading to physiological stress causing ecological disturbance[5–7].

*For correspondence. (e-mail: seemamakhija@andc.du.ac.in)

Toxicity of various heavy metals can be studied using ciliated protists[8–10]. These eukaryotic microorganisms are found in a variety of trophic niches, have generation time of 3–7 h and many are easy to culture *in vitro*[11]. Ciliates share a higher degree of functional and genetic similarities with humans than bacteria or yeast (microbial eukaryotic model organism)[12–14]. All these properties make them suitable candidates both for eco-toxicological studies and for monitoring water quality[15–17].

In the present study, we assess the toxicity of essential (Cu and Zn) and non-essential (Cd, Ni and Pb) heavy metals on ciliated protists isolated from three different freshwater ecosystems (river, lake and pond) in the Delhi region, India. The diversity of free-living ciliates in the study sites was observed for a period of one year. The most frequently encountered ciliate species were from four genera, namely *Euplotes*, *Notohymena*, *Pseudourostyla* and *Tetmemena* (Figure 1) and all were easily cultured under laboratory conditions. Toxicity assays were carried out *in vitro* in order to determine the sensitivity and survival of *Euplotes* sp., *Notohymena* sp., *Pseudourostyla* sp. and *Tetmemena* sp. to different doses of heavy metals.

Materials and methods

Study area

Delhi is located in northern India. It is bordered by the states of Haryana to the north, west and south, and Uttar Pradesh (UP) to the east. Prominent features of the geography of Delhi include the floodplains of River Yamuna. In the present study three sites were selected in different ecological regions of Delhi.

Site 1: Okhla Bird Sanctuary (28.5700°N, 77.3023°E): This is a bird sanctuary at the Okhla Barrage over the Yamuna. The site is located at the point where the river exits Delhi and enters UP. The most prominent feature of the sanctuary is the large lake created by a dam over the

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Materials and methods

Study area

Delhi is located in northern India. It is bordered by the states of Haryana to the north, west and south, and Uttar Pradesh (UP) to the east. Prominent features of the geography of Delhi include the floodplains of River Yamuna. In the present study three sites were selected in different ecological regions of Delhi.

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Superoxide dismutase (SOD), which gets activated in response to oxidative stress at first, plays a major role in catalyzing the dismutation of superoxide anion ($O_2^{\cdot-}$) into O_2 and H_2O_2[13,14]. SOD exists in several isoforms including cytosolic copper-zinc SOD (SOD-1), mitochondrial manganese SOD (SOD-2)[15] and extracellular/chloroplast iron SOD (SOD-3)[14,16].

A major hydrogen peroxide (H_2O_2) detoxifying system in the cells is ascorbate-glutathione cycle, where ascorbate peroxidase (APx) plays a key role in catalyzing H_2O_2 into H_2O using ascorbate as a specific electron donor[12]. GSH is a tripeptide (L-γ-glutamyl-L-cysteinylglycine) synthesized in two consecutive steps catalyzed by γ-glutamyl-cysteine synthase and glutathione synthetase[17]. GSH also acts as substrate for glutathione peroxidase (GPx) to catalyze hydrogen peroxide[7]. Changes in these antioxidant enzymes including ASC-GSH cycle enzymes have been observed in various organisms exposed to different abiotic stress including heavy metals. Overexpression of any of these enzymes by a particular organism has shown higher resistance to the abiotic stress as compared to the organisms under-expressing these enzymes[18,19]. Studies on heavy metal induced oxidative stress and generation of ROS have

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Assessment of particulate matter (PM) concentrations at a typical construction site in Bangalore, India

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Int. Res. J. Environment Sci., **Volume 6, Issue (2),** Pages 14-18, February,22 **(2017)**

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Abstract

Construction sites pose a major challenge to the environment due to presence of different types of particulate matter (PM). Concentration of particulate matter is a typical indicator for urban air quality. Although it has long been recognised that construction activities are a pertinent source of PM emissions, not much research has gone in this direction. The investigation envisages quantification of the PM emissions at a construction site for particulates having varying aerodynamic diametersfine particles 2.5 &

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Volume 238, January 2017, Pages 83-90

Distinct detection of liquor ammonia by ZnO/SAW sensor: Study of complete sensing mechanism

V. Bhasker Raj [a], Harpreet Singh [b], A.T. Nimal [b], M.U. Sharma [b], Monika Tomar [c], Vinay Gupta [d]

Show more

https://doi.org/10.1016/j.snb.2016.07.040

Abstract

ZnO/SAW sensor was reported to give distinct response towards liquor ammonia. To study the complete mechanism, ZnO thin films (40 nm) were deposited using rf sputtering in different reactive gas composition of argon and oxygen. The increase in oxygen content (30–100%) during film growth leads to decrease in the value of stress and bond energy. The individual contribution of different SAW sensing mechanisms such as mass loading, elastic effects and acousto-electric interaction, was evaluated and analyzed to understand the distinct response for liquor ammonia. It was found that mass loading seems to get affected by the presence of stress whereas elastic loading was affected by the crystallite size and bond energy (Zn—O) in ZnO thin films.

Sensitivity Enhancement Studies of SAW Vapor Sensor by Oscillator Tuning Using Varactor Diode

Publisher: IEEE

Harpreet Singh ; Yashoda Parmar ; V. Bhasker Raj ; Haresh M. P... **All Authors**

Abstract:

This paper reports the designing of surface acoustic wave (SAW) oscillator with varactor diode (or varicap) as a part of tuning element. A practical way to enhance sensitivity of SAW sensor oscillator is performed by tuning capacitance using varicap. The varactor diode is placed at three different locations of the oscillator circuit to realize three different configurations. The change in frequency with applied voltage to varactor diode is studied for all three configurations. Sensitivity study for the three configurations is carried out with di-methyl methyl phosphonate vapor. The sensitivity, stability, and noise of each configuration are analyzed. Using varicap, about six times enhancement in sensitivity (~1.15 kHz/ppm) could be achieved. A simple and additive electronic method of tuning is utilized to improve sensitivity as compared with other methods that involve major changes in the sensor.

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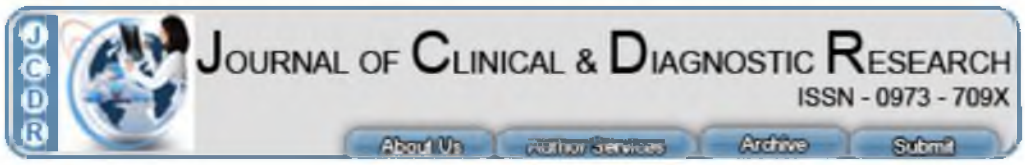

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doi: 10.7860/JCDR/2017/28565.10425

PMCID: PMC5620896 | PMID: 28969255

Alterations in the Reactive Oxygen Species in Peripheral Blood of Chronic Myeloid Leukaemia Patients from Northern India

Sunita Jetly,[1] Neha Verma,[2] Kumar Naidu,[3] Muneeb Ahmad Faiq,[4] Tulika Seth,[5] and Daman Saluja[6]

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Abstract

Go to: ▸

Introduction

There is a significant difference in the Reactive Oxygen Species (ROS) levels of Chronic Myeloid Leukaemia (CML) patients before and during treatment with Tyrosine Kinase Inhibitors (TKIs). This is because high ROS levels support oncogenic phenotype of CML by inducing proliferation pathway and accumulation of further genetic mutations. Often the measurement is done on WBC or serum for ascertaining one type of ROS species, but measurement of global ROS in fresh whole blood will give more accurate estimation of ROS.

Article Details

An Analysis upon Various Strategies for Redesign and Direct Evolution of Enzyme Engineering | *Original Article*

— Sudha Vipin Sharma*, Sunita Hooda, in *Journal of Advances in Science and Technology* | *Science & Technology*

ABSTRACT

Enzymes are biocatalysts evolved in nature to achieve the speed and coordination of nearly all the chemical reactions that define cellular metabolism necessary to develop and maintain life. The application of biocatalysis is growing rapidly, since enzymes offer potential for many exciting applications in industry. The advent of whole genome sequencing projects enabled new approaches for biocatalyst development, based on specialised methods for enzyme heterologous expression and engineering. The engineering of enzymes with altered activity, specificity and stability, using sitedirected mutagenesis and directed evolution techniques are now well established.

The use of enzymes in industrial applications has been recognised for providing clean processes with minimal impact on the environment. Enzyme engineering is undergoing the most profound and exciting transformation in its history. It promises unprecedented expansion in the scope and applicat[illegible]f modified or improved enzymes with desired physi[illegible]l catalytic properties. Two complementary strategies are cu[illegible]ly available: rational redesign and directed evolution. Although

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Comparative study of Removal of Cu and Pb from Aqueous Solution by using Rice Husk Ash as an Adsorbent

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[1]Department of Chemistry, OPJS University, Churu, Rajasthan, India [2]Acharya Narendra Dev College Govind Puri, Kalkaji New Delhi-110019 [3]Scientific and Applied Research Center [SARC], Meerut, Uttar Pradesh, India.

Abstract:- The adsorption efficiency of Rice husk ash powder for the removal of Cu and Pb was studied as Rice husk ash consist of silica , alumina , mangnesium oxide , calcium oxide etc. The research is a batch scale experiment using different amount of adsorbent in solution with five different concentrations (5, 10, 15, 45,100 mg/L) of both metals and in mixed combination. About 92% to 100% Cu removal achieved by using 0.5 to 1.5 g adsorbent for solution having concentration of 5 and 10 mg/L of Cu. Two main things comes out by the above study, first, the adsorption efficiency depends on the amount of adsorbent as the adsorption efficiency of Pb was increased from 80% to 100% in the same solution (5mg/L). it was also found that adsorption efficiency decreased about 2.5 % and 5.8% of Cu and Pb to mixed metal solution, which clearly indicates that the presence of more metals in the solution will decrease the adsorption efficiency.

I. INTRODUCTION

The release of industrial effluents containing heavy metals to the river water causes several adverse effects. Water is essential to all forms of life and makes up 50-96 % of the weight of all plants and animals. It is also a vital resource for agriculture, manufacturing and other human activities. In urban areas, the careless disposal of industrial effluents and other wastes in rivers & lakes may contribute greatly to the poor quality of river water [1-4]. African countries and Asian countries experiencing rapid industrial growth and this are making environmental conservation a difficult task[5] . Heavy metals are dangerous environmental pollutants due to their toxicity and strong tendency to concentrate in environment and in food chains[6-7] . The source of environmental pollution with heavy metals is mainly industry, i.e. metallurgical, electroplating, metal finishing industries, tanneries, chemical manufacturing, mine drainage and battery manufacturing [8]. Considerable research been carried out over the last decade on the protection against plant and animal life degradation. Several big cities contribute to increase this problem, as they are sources of industrial effluents. In order to reduce the environmental pollution, a number of studies been considered to minimize the problems caused by the commonly employed treatment of metal bearing effluents [9-10]. Removal of metals from wastewater achieved principally by the application of several processes such as adsorption[6], sedimentation[11], electrochemical processes[12], ion exchange[13] ,cementation[14], coagulation/flocculation[15] , filtration and membrane processes[16] Chemical precipitation and solvent extraction[17-18] . Adsorption is the one of the important procedure for the removal of heavy metals from the environment because of strong affinity and high loading capacity. Moradabad also known as Brass City of India situated at a distance of 167 km from the national capital, New Delhi (NH 24), on the bank of river Ramganga and located at 28.830 N 780 E. It has an average elevation of 186 meters (610 feet) above sea level. The city has seen rapid industrialization during last few decades. The city is full of brass and steel industries. Most of these industries are in unorganized sector and thus have unplanned growth leaving to high degree of air, water and soil pollution[19-20] . The most of the industries are dumping their effluents in Ram Ganga River pass from the heart of the city. A large number of small-scale manufacturing units of brass been also situated in the heart of the city. As Copper, Zinc & Lead and its compounds used in brass industries, the continued intake of copper and lead by humans leads to severe diseases like mucosal irritation, depression and most dangerous lung cancer. Therefore, there is a considerable need to treat industrial effluents containing such heavy metals prior to discharge to protect public health. The metal needs to be removed from industrial effluents before discharge into the environment to minimize any impact on plant, animal and human beings. In the present study, adsorption potential of low cost adsorbent (Rice husk ash) towards Cu and Pb has been examined.

II. MATERIAL AND METHODS:

Adsorbents The RHA from Amrit Vanaspati Company Ltd Punjab, India. It was washed with distilled water until the pH was constant, dried in an oven at 105°C for 24 h. It was cooled in incubator and determined its size distribution by USA Standard Sieve (≤125, 125-250, 250-500 μm). The size distribution results are shown in Table 1. Thus, studied particle size was 250-500 μm. Preparation of Modified Rice Husk Ash

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Developing a Low Cost Activated Carbon from Agricultural Waste for the Removal of Heavy Metal from Contaminated Water

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[3]Scientific and Applied Research Center [SARC], Meerut, Uttar Pradesh, India.

Abstract

Rice husk ash is find out from the burning of agricultural waste material in paper industry due to it abundantly available in rice-producing countries. Activated carbon of rice husk (ACRH) was used to remove Cr(VI) from waste water. In this study we also use of the Batch process for study of the effect activated carbon of rice husk for Cr(VI) removal from aqueous solutions. In this paper we also studies of pH effect, contact time, adsorbent dose were examined. The removal decreased from 86.2 to 44.2% by increasing the Cr(VI) concentration from 1.5 to 5.0 mg/l. Removal, however, decreased from 80.0 to 42.2% by increasing the adsorbent particle size from 50 µm to 150 µm. The adsorbed dose of Cr(VI) tend to increase with the increase of pH. It has been found that low cost and high capabilities of the ACRH make it potentially attractive adsorbent for the removal of Cr (VI) from wastewater.

Keywords: Removal; Rice Husk ; Adsorption ; pH; water; Activated Carbon of rice husk etc.

INTRODUCTION

Chromium is an important heavy metal, and it is generally used in leather industry, electroplating, metal processing and paint and pigment. Removal of heavy metals by adsorption is an turn up field of research [5], Activated carbon is an effective adsorbent

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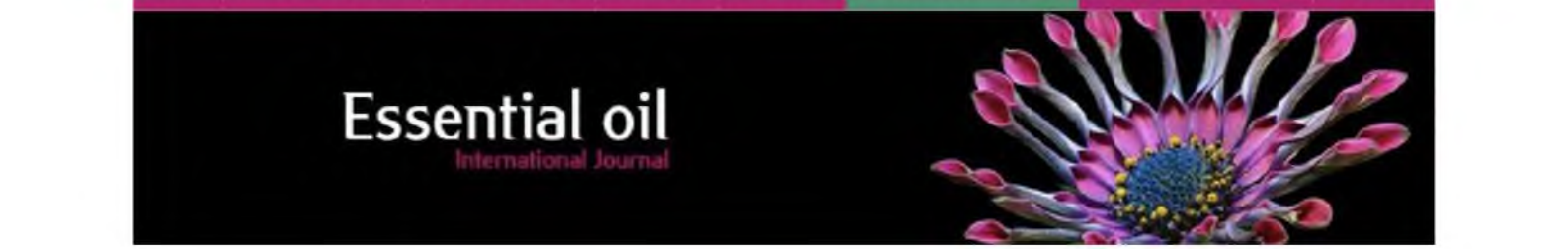

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Sportsmen's energy package *Cordyceps sinensis*: Medicinal importance and responsible phytochemical constituents

AUTHOR(S): Yogesh Chandra Joshi, Mukesh Chandra Joshi, Vivek Chopra, Rakesh Kumar Joshi, Rajni Kant Sharma and Vikrant Kumar

ABSTRACT:
Yarsagumba (*Cordyceps sinensis*) is one of the world rarest fungal species that parasites on the body of a caterpillar of a moth and found underground of alpine grass at high altitude. The *Cordyceps sinensis* is known as "summer plant and winter insect" or "*half*-caterpillar-*half*-mushroom". This fungus used for various medicinal purposes, caring diseases and specially used as a food product in China and south Asian countries. It contains various biologically active pharmacophores which helps to maintain the health and body. Reports say that, the regular use of *Cordyceps*, is very useful for sportsperson to maintain their body balance, endurance, strength, and to make healthy body weight etc. On the basis of scientific and manmade facts, we tried to summarise, why *Cordyceps* is recommended to sport person as a physical booster. It contains various bioactive pharmacophores including essential oil, which are medicinally important. Thus body always looks for such type of dietary supplements.

Pages: 37-51 | **2058** Views **71** Downloads

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Online Signature Verification: A Review

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Abstract: *In past few decades Online Signature Verification have been employed in many applications such as security control, banking, law enforcement etc. A number of techniques have been proposed in the realization of reliable signature verification system such as Dynamic Time Wrapping (DTW), Hidden Markov Model (HMM), Support Vector Machine (SVM) and Neural Networks (NN)In this paper we have presented a review of research carried out in recent field of online signature verification and made a qualitative analysis of these state-of-the-art approaches.*

Keywords: *Signatures, Verification, fraudulence, feature Extraction, training, Forgery*

I. Introduction

Biometrics is the utilization of physiological traits (face, iris, and fingerprint) or behavioral traits (signature, voice) for the verification of an individual identity. Biometric based authentication system is a trustable alternative to the password-based security systems as it is relatively hard to be forgotten, stolen, or guessed.

Signature being a behavioural biometric it is mainly used in the banks to verify the checks and accounts. Unlike physiological biometrics, it is fraught with problem of change over a time and it is not difficult to forge. One of the main challenges in signature verification is related to the signature variability. While signatures from the same user show considerable differences between different captures (high intra-class variability), skilled forgers can perform signatures with high resemblance to the user's signature (low intra- class variability). Signature verification aims at using such properties for making reliable authentication. However the wide spread acceptance of the signature by the public makes it more suitable for certain lower-security authentication needs. However, signature verification is a challenging task due to practical constraints. For instance, MasterCard estimates a $450 million loss each year due to credit card fraud, likewise some billions of dollars being lost because of fraudulent encashment of checks. Reliable automatic signature verification could be a proper solution to reduce such losses since handwritten signatures are already involved in the credit card transactions and bank checks encashment.

1.1 The Signature Verification Modes

There are two modes to the signature verification depending on how the signatures are collected from a user.

Offline (static) Signature Verification: In this mode data is acquired by scanning handwritten signatures which are then processed as static images. The verification is based on these static signature images. This mode is useful in automatic verification of signatures obtained from bank checks and other paper documents.

Online (dynamic) Signature Verification: In this mode the signatures are captured by social hardware (e.g. smart pens or pressure sensitive tablets) which is capable of measuring dynamic properties of a signature in addition to the shape, while shape is the only information in offline signatures. Dynamic information (e.g. pen pressure) makes the signature more unique and more difficult to forge.

Applications of online signature verification include identity verification in payments using a credit card; authorization of computer users for accessing sensitive data or programs, authentication of individuals for accessing physical devices or buildings, and protection of small personal devices from unauthorized usage.

Online signature verification is more robust, reliable and accurate than offline signature verification as its dynamic properties make the process of forging an online signature more difficult. Therefore online signature has become an attractive biometric method as it facilitates the authentication of the internet transactions and contracts (e-commerce, e-banking, e-business, e-contract).

Need

Signature is a special characteristic of any person. By the help of signature we can identify the person. In today day to day life as we talk about the verification of any person, we normally verify them by two ways firstly by face and secondly by signature. In banking or security system the person is normally verified by his or her signature. Hence we can say that the signature is alternate way to identify the person. In most of the organizations, the signature is normally verified by their experts by matching old signature's samples.

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Comparative Analysis on Path Planning Algorithm's on Mobile Robot in Image Processing

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Abstract:- *This paper presents an analysis on different path planning algorithms for mobile robot in static environment. It investigates three well known path panning algorithms and compared their performance on the basis of their working parameters and the computation time to find the solution. It also finds the shortest distance for the static environment and compared the computational distance from start to goal point at different levels for all the three algorithms. It has been tested at different shape of the image and computational time and length for all the three algorithms and verified. Image processing places an important role in the field of mobile robot navigation. There are different methods are used for navigation. In this paper, we reviewed around 23 papers are briefly described the amount of existence of the work for each motion planning approach. This paper includes a comparative study using C++ based approach on mobile robot with respect to image processing. Showing how the behavior and activity of the research paper has taken a change towards the navigation processes which controls navigation using NFT , A*and D*Lite algorithms. It has been seen that many times the researchers use image processing technique for obstacle avoidance or it use singles from gesture control or it takes the help of smart phone with sensor to find the obstacle to reach the destination. Finally some open areas and challenging topics are discussed. There are many different algorithms developed for the path planning by researchers in the field of robotics, water based resources, navigation and internet based games. The algorithms used in this field is A*, D* Lite and NFT (neighbour finding technique). Here we compared three algorithms and established a comparison path based approach to differentiate both the algorithms. We used a grid search technique using A* algorithm and quad tree approach using neighbour finding technique algorithm and also we used a DDA algorithm to optimize the NFT based path planning approach and compared.*

Keywords: *Path Planning, Algorithms, Grid search, Quad Tree, NFT (Neighbour finding technique), D*Lite, Digital Differential Analyzer (DDA).*

I. INTRODUCTION

The field shortest path planning is closely related to robotics where as the algorithms used here applied in different fields as per the requirement. Planning mobile robot is a challenging task for mobile robot navigation and also researchers provided different approaches for the shortest path planning strategies in the field of mobile robot games and many more applications. Each plan has its own advantage and disadvantage the basic goal is to reach the robot from source to destination. Here we used grid search and quad tree based path planning method for path planning with the help of A* algorithm[3,16] , Neighbour finding method[6,7] and D* Lite[8] to verify the difference in their approach .Here we have presented a real image presented in the form of square picture shape and represented at different part of the block as shown in the fig1 (a, b, c).The boundary is taken as (80,80) and (400,500)).In this paper we planned for robots for different algorithms. First we represent the image as a square of different size then embedded these different size images in the (80,80) and (400,500) screen size. After the design is proposed all used algorithms introduced and applied on the image to find the shortest path. These all are it are simulated and the result is compared.

II. THE APPROCH

The quadtree initially come up with [4] , It is an approach where the complete tree is represented as a square and the square is divided in to four sub branches of equal size ad shown in fig 1(a) as row1 and coum1(R1C1) and row1colum2(R1C2) and also the tree form in a said form that each node has four different quadrants as shown in fig 1(b,c) While dividing the [6] image into four quadrants each node has four sons each node represented with(R1C1,R1C2,R2C1,R2C2).

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IMPACT OF DDA OPTIMIZATION ON MOBILE ROBOT PATH PLANNING FOR MIXED IMAGE IN IMAGE PROCESSING

Rama Kanta Choudhury, Chandra Kanta Samal

ABSTRACT

Existing problem solving in the day to day environment requires computational intelligence. Path planning is one of the most important technologies in the navigation of the mobile robot, which should meet the optimization and real-time requests. The objective of the paper is to present a noble approach to find the efficient and effective path planning for mobile robot. Here first the image is located on the graph and then a quadtree is formed, according to the working space image with respect to the obstacle image. Then the NFT algorithm is used to obtain the shortest path from the start point to the goal point in the graph. Finally the DDA optimization algorithm is adopted to get the optimal path. Aiming at the shortcoming of the DDA algorithm which is easily plunging into the local minimum, DDA algorithm with NFT is put forward. The results of the simulation demonstrate the effectiveness of the proposed method, which can meet the real-time requests of the mobile robot's navigation. Here we have taken two different types of images, one square shape and other is mixed image of different shapes like triangle and circle. The working space is tested and result is verified using NFT Algorithm with DDA optimization.

KEYWORDS

DDA, Grid search, Quadtreee, NFT (Neighbour finding technique)

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Target Assignment in Robotics and its Distance Optimality Using DDA Optimization in Image Processing

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Keywords: DDA, Grid search, Quadtree, NFT (Neighbour finding technique)

ABSTRACT

Many difficult problems solving require computational intelligence. One of the major directions in artificial intelligence consists in the development of efficient computational intelligence algorithms, evolutionary algorithms, and neural networks. Some systems operate in isolation or cooperate with each other, some optimized techniques are used to resolve the mobile path planning, DDA is one of them. The behavior could emerge an intelligence called systems intelligence, and intelligence of a system. The shortest path planning approach and its optimization for the mobile robot in a static and dynamic environment are the major tasks in the field of Robotics. In the present day environment finding collision-free, the shortest path is the fundamental issue in the path planning. In the mobile robot, the processing time and reaching time is very important. The path time is to be reduced so that the complexity is reduced. During the process, it is found that few algorithms have its own advantages and disadvantages. Here we presented a DDA optimization technique for optimization.

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Mobile Robot Path Planning Approach: A Review

Rama kanta Choudhury[1], Sanjay Kumar[2] And Chandra Kanta Samal[3]

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3 Computer Science, Delhi University, AND College, New Delhi, India.

Abstract

The shortest path planning approach and it's optimization for mobile robot in static and dynamic environment is the major task in the field of Robotics. In the present day environment finding collision free shortest path is the fundamental issue in the path planning. We have reviewed 100 papers on path finding technique in static and dynamic environment. Path planning in static environment is easy as compared to dynamic environment as in dynamic environment the obstacles are moving. Whereas optimizing the path is difficult in the static environment as well as in the dynamic environment. As per the timing is concerned, the path time is to be reduced so that the complexity is reduced. During the review process it is found that few algorithms have its own advantages and disadvantages as presented. Also a comparative study of different path planning techniques for static and dynamic environment is provided in this paper. The main focus in this review is to find the shortest path efficiently and effectively.

Keywords: *Path Planning, Algorithms, Grid search, Quad Tree, NFT (Neighbour finding technique), D*Lite*

1. Introduction

The survey is distributed into different sections as per our requirement. the main aim of this survey is to find the shortest path from source to destination with known and unknown environment in the presence of obstacles or when the obstacles come on the way. Mobile robots are authorized to move automatically from one point to other to reach their destination. They choose their own path to reach their destination without any hindrance with their preplanned path [1]. This paper provides a review of such papers based on their way to reach the target with the specified algorithms. Here we have reviewed many approaches and implemented. Efficient path planning approach is very important for mobile robot to follow the path. Here the main approach of the review is to find the different algorithms used and approached to find the shortest path from source to destination. Here the configuration of the robot is described by number of obstacles based on their position and sense of direction of the robot in the 2D and 3D environment [2]. A clear idea of planning and computing of collision free path is presented with given points with different algorithms. While reviewing papers we found that in mobile robot navigation, researchers used many algorithms out of which are A*, D* and D*Lite algorithm with grid search and quad tree methods [2][3][4][10][12][13]. ***The task of moving robots in mapped environments is a step by step approach; planning of the paths, optimal by certain criteria and controlling the robot to execute the planned paths. In this path planning, the task of finding a collision free path is to lead a robot from the initial configuration to the goal configuration among a set of obstacles. Generally, obstacles are modeled as polygons. The initial and the goal configurations are described by the***

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Architecture Based on Environmental Monitoring System using ZigBee Wireless Sensor Networks

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Abstract

Wireless Ad hoc sensor nodes are playing an important role in wireless data transmission infrastructure in various environmental monitoring systems. Due to its compact size and energy efficient structure these nodes can be successfully deployed in wireless Ad hoc infrastructure. Recent developments wireless sensor technologies have provided the environmental management systems with capabilities of real time remote environmental monitoring system. We propose system architecture for wireless sensor networks and a database model for handling and storing sensor data stream in real time. The ZigBee wireless sensor networks is useful especially in monitoring or detecting possible natural disasters and reporting on it almost at real-time. A web based application developed to enable remote online access to wireless sensor network data with interactive data retrieval and visualization functionalities. The advantage of modular architecture is minimizing the software upgrade down time and enables hardware reusability.

Keywords:- ZigBee Network, Wireless Sensor Network, Disaster, Modular Architecture, Database Model.

1. Introduction

A Wireless sensor network (WSN) is a self configured and infrastructure less wireless networks. It consists of a number of sensors nodes (few tens to thousands) working together to monitor a region to obtain data about the environment. There are two types of WSNs: structured and unstructured. Unstructured WSN contains dense collection of sensor nodes and often deployed in ad-hoc manner in the field. In an ad-hoc deployment, sensor nodes can be dropped from a plane and randomly into the target area. In structured WSN on the other hand, all or some of the sensor nodes are deployed in a pre-determined locations. Structured network has fewer nodes and can be deployed with lower network maintenance and management costs.

A wireless sensor network (WSN) to monitor physical or environmental conditions such as temperature, sound, pressure, vibration, pollutants and to cooperatively pass their data through the network to a main location, where the data can be observed and analyzed . Wireless sensor networks have application of fields such as climate control, environmental monitoring, military surveillance, structural health monitoring, medical diagnostics, disaster management and emergency response [4]. The sensor nodes can communicate among themselves using radio signals and they have limited processing speed, storage capacity and communication bandwidth. The ZigBee Wireless Networks based on the IEEE Standard 802.15.4 as specifications, this wireless sensor networks (WSN) consists of light-weight, low power and small size sensor nodes (SNs). They have ability to monitor, calculate and communicate wirelessly. A set of applications require simple wireless connectivity, relaxed throughput, very low power, short distance and inexpensive hardware e.g. Industrial, Agricultural, Vehicular, Residential, Medical etc. Global climate change and atmospheric warming is increasing the occurrence of extreme climate phenomenon with increasing severity, both in context of human living as well as economic losses.

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Low Power Consumption in ZigBee Wireless Networks: A Survey

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Abstract

The ZigBee technology is an IEEE 802.15.4 standard for data communications dealing with business and consumer devices. The ZigBee standard provides network, security and application support services operating on top of the IEEE 802.15.4 Medium Access Control (MAC) and Physical Layer wireless standard. ZigBee is a low-cost, low-power, wireless mesh networking standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking which promises high reliability and larger range. In industry ZigBee is being used for next generation automated manufacturing, with small transmitters in every device on the floor, allowing for communication between devices to a central computer. This new level communication technology permits finely-tuned remote monitoring and manipulation.

Keywords:- *ZigBee, MAC, Wireless mesh networking, High reliability, Communication technology etc.*

I INTRODUCTION

The ZigBee technology is the wireless mesh networking standard created for connecting sensors, instrumentation and control systems. This is based on the IEEE 802.15.4 Standard and used in Wireless Personal Area Networks (WPANs) for high level communication. This technology is created by the ZigBee Alliance. Wireless sensor networks (WSN) consists of light-weight, low power and small size sensor nodes (SNs) [3]. They have ability to monitor, calculate and communicate wirelessly. The ZigBee Alliance organized as an independent, neutral and non profit corporation in 2002, it is open and global and any one can join and participate, membership is global. An organization with a mission to define reliable, cost effective, low-power, wirelessly networked, monitoring and control products based on an open global standard. Alliance provides interoperability, certification testing, and branding [15].

IEEE 802.15.4 is a standard which specifies the physical layer and media access control for low-rate wireless personal area networks (LR-WPANs). It is maintained by the IEEE 802.15 working group, which defined it in 2003 [3]. IEEE standard 802.15.4 as specifications for low-data-rate wireless connectivity with fixed, portable, and moving devices with no battery or very limited battery consumption requirements typically operating in the personal operating space (POS) of 10m [15]. It is foreseen that, depending on the application, a longer range at a lower data rate. The ZigBee wireless networks targets the application domain of low power, low duty cycle and low data rate requirement devices. Figure-1 below shows the example of a ZigBee networks. The ZigBee Networks, Coordinators are the most capable of the three node types. There is exactly one coordinator in each network and it is the device that establishes the network originally. It is able to store information about the network with including security keys. Routers act as intermediate nodes, relaying data from other devices.

Table-1: ZigBee 802.15.4 standard specifications

Parameter	Range
Transmission Range(meters)	1-100
Battery Life (days)	100-1,000
Network Size(# of nodes)	>64,000
Throughput(kb/s)	20-250

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THE WHITE WOMAN'S GAZE

The nineteenth century was, perhaps, the greatest period of travel writing. Under Queen Victoria, Britain became the greatest power in the world with political and economic control over her colonies spread all over the globe, from Asia to Africa and the Caribbean Islands. Many British travellers and missionaries went to the colonies to take up what Kipling called the "White Man's Burden" – to "civilize" the "barbaric" races of Asia and Africa. Kipling urged them to take on the responsibility of ruling the Empire in his poems:

Take up the White Man's Burden –
Send forth the best ye breed –
Go, bind your son's in exile
To serve your captive's need:
To wait in heavy harness
On fluttered folk and wild –
Your new-caught, sullen peoples,
Half-devil and half-child.

- The White Man's Burden, 1899

These were Englishmen who saw the East "as an inferior, degenerate, erotic place which requires the guiding light of Western civilization" (Laishram 27). The East offered them a chance to escape boredom, failure and poverty in England. India and the East also offered an opportunity to secure wealth and adventure, prestige and identity. Ram Chandra Prasad, in his work on early English travellers to India, differentiates between the attitudes of the early travellers and the ones who came later: "The European travellers of the fifteenth and sixteenth centuries continued to approach India in a mood of child-like wonder, without the least sense of racial superiority. Until

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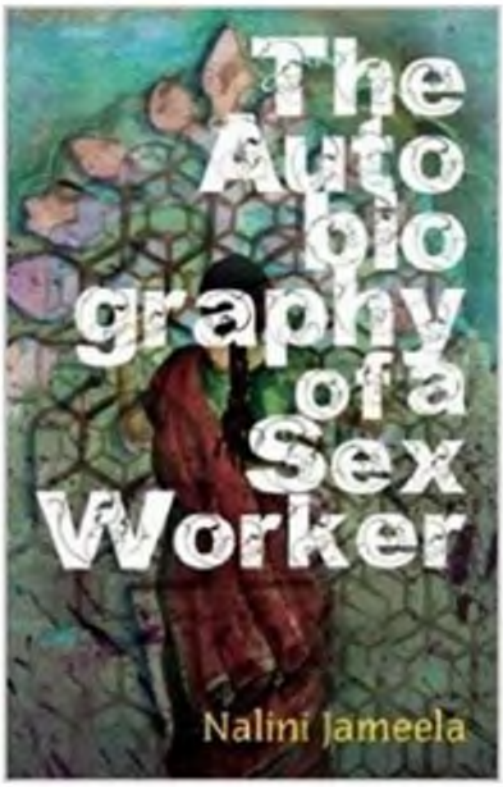
Society and Sex Work in *The Autobiography of a Sex Worker* by Nalini Jameela

Manoj Kumar Garg, M.A., M.Phil.



Abstract

Sex workers are part of society but they are looked down upon as outcast in Indian society. They are exploited, insulted and humiliated. Even female sex workers are not taken as women rather taken as mere sex objects. Nalini Jameela portrays their plight through her biography *The Autobiography of a Sex Worker*. She herself has worked as a sex worker. She doesn't condemn the sex work rather takes it as a profession. This paper studies the problems faced by the sex workers, dual standards of society, and resilience of the sex workers.

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Adoption of Free and Open Source Software in India

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Abstract

The significance and robustness of Free and Open Source Software (FOSS) are now well known at stages of development as well as deployment. It's natural to assume that the products of FOSS to be deployed as a preference over the commercially available propriety software. However, proprietary software not only exists but is also thriving. The present paper looks into the aspect of adoption of FOSS, with special emphasis to India. The two natural arena for adoption- Governance and Academia are chosen for study. The policy initiatives, frameworks and challenges in the implementation of FOSS in these two areas are discussed, while giving instances of its successful adoption. The study also discusses in brief the adoption of FOSS in business enterprise, where its adoption is dynamic and accelerated. Several challenges in adoption of FOSS over propriety software are also pointed out.

Keywords: Adoption, FOSS, Proprietary software

INTRODUCTION

The Free and Open Source Software (FOSS) movement attained prominence in the 1980s, primarily to unshackle the restrictions imposed on the use of copy righted software, now known as CSS (Closed Source Software). Today, although one may not be aware, FOSS is actually providing for the computational requirements for a large spectrum of products and services which make the modern, technologically intensive digital life possible. Most of the smart phones (android based), servers and portals, ATMs, supercomputers, databases etc around the world are FOSS driven. In India, two humongous citizen-specific projects – Aadhar's online infrastructure and the railway booking website utilizes the Linux servers. The FOSS provides a myriad of advantages over the CSS at all stages – development, distribution and research, which have been extensively mentioned in the literature [1-5]. Given the intrinsic freedom of usage, customization, propagation and the relative cost effectiveness which all products of FOSS offers, the adoption of FOSS by a country like India could have been a natural and prudent choice as the nation endevours to upscale the use of IT (information technologies) in its pursuit of digital governance. In this context, one may be betting on India becoming the global FOSS hub. It's evident to expect that the India is a fertile ground for the nurturing of a strong and mature FOSS ecosystem. A FOSS ecosystem comprises of a multitude of stakeholders – government, academic institutions like schools and colleges, FOSS solution providers and the FOSS community. Moreover, in India there is no dearth of business opportunities for providing IT solutions to enterprise. This is because India is only next to China in having the largest base of Internet users, notwithstanding the fact that 80 per cent of its population still needs to go online. When this is seen in the background of the availability in the last two decades of large number of reliable and robust FOSS products, which provides solutions for all domains, wherein the CSS have hitherto provided the services (Refer Table 1) the above expectation is certainly not misplaced.

So, where does India stand on the adoption of free software? The adoption of FOSS in India, until now can be described as patchy and sporadic, without a concerted push to adopt FOSS in the daily computational needs of various spheres viz., Governance, academia and business enterprise. However, it must be mentioned here that although the growth of FOSS in India has witnessed a faster rate than the past, the FOSS ecosystem is far from the threshold level of maturity. This has resulted into a narrow user base for FOSS in India. The government's efforts for FOSS adoption have been varied. While some efforts are subtle, voluntary and staggered, some migrations to FOSS have been hard and coercive. In most cases, migration to FOSS are justified from the perspectives of cost and security and its salient features of being participative, egalitarian and democratic is not emphasized sufficiently. While the goal of making India a global hub for FOSS is laudable, it becomes necessary to examine the extent of adoption and the associated challenges in the migration to FOSS for the computational needs of the digital society which we envisage in India. The present paper surveys the extent of adoption of FOSS in the three major areas of the Indian society i.e., Governance, academia and business enterprise. The study also attempts to identify the impediments in each of these spheres which are inhibiting the development of a supportive and mature ecosystem around FOSS which can harness FOSS to its full potential.

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Adoption of Free and Open Source Software in India

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INTRODUCTION

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ARTICLE NAVIGATION

RESEARCH ARTICLE | AUGUST 07 2017

Nanosecond laser-cluster interactions at $10^9 - 10^{12}$ $\mathrm{W/cm^2}$

Rohtash Singh; V. K. Tripathi; R. K. Vatsa; D. Das

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An analytical model and a numerical code are developed to study the evolution of multiple charge states of ions by irradiating clusters of atoms of a high atomic number (e.g., Xe) by $1.06\ \mu\mathrm{m}$ and $0.53\ \mu\mathrm{m}$ nanosecond laser pulses of an intensity in the range of $10^9 - 10^{12}\ \mathrm{W/cm^2}$. The laser turns clusters into plasma nanoballs. Initially, the momentum randomizing collisions of electrons are with neutrals, but soon these are taken over by collisions with ions. The ionization of an ion to the next higher state of ionization is taken to be caused by an energetic free electron impact, and the rates of impact ionization are suitably modelled by having an inverse exponential dependence of ionizing collision frequency on the ratio of ionization potential to electron temperature. Cluster expansion led adiabatic cooling is a major limiting mechanism on electron temperature. In the intensity range considered, ionization states up to 7 are expected with nanosecond pulses. Another possible mechanism, filamentation of the laser, has also been considered to account for the observation of higher charged states. However, filamentation is seen to be insufficient to cause substantial local enhancement in the intensity to affect electron heating rates.

Topics

Adiabatic process, Lasers, Ions and properties, Chemical

Laser and Particle Beams

Pulse-compression and self-focusing of Gaussian laser pulses in plasma having relativistic–ponderomotive nonlinearity

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S. Kumar, P.K. Gupta, R.K. Singh, S. Sharma, R. Uma and R.P. Sharma

Article contents

Abstract

The mathematical model for the propagation of intense laser pulse in a plasma having Gaussian profile is investigated. The model has been formulated considering that the relativistic–ponderomotive nonlinearity dominates over other nonlinearities in the plasma. Model equation for self-compression and self-focusing properties of the laser pulse has been set up and solved by both semi-analytical and numerical methods. The result indicates that due to the effect of group velocity dispersion, diffraction of the laser pulse and the nonlinearity of medium, the pulse width parameter as well as beam width parameter of pulse gets focused at a different normalized distance, and hence the normalized intensity is also deferred at those points. Numerical simulation shows an oscillatory behavior of intensity during propagation in the plasma either having minimum beam radius (r_0) or having minimum pulse duration (t_0) depending on the normalized distance.

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Detection of liquefied petroleum gas below lowest explosion limit (LEL) using nanostructured hexagonal strontium ferrite thin film

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ABSTRACT

The nano crystalline hexagonal strontium ferrite nanoparticles $SrFe_{12}O_{19}$ were synthesized successfully by chemical co-precipitation method. Thin films of strontium ferrite were prepared on glass substrate and characterized by various techniques such as XRD, SEM, TEM, EDS, UV-spectroscopy and FTIR. XRD pattern revealed the phase transformation of M-type hexa-ferrite with the minimum crystallite size of 18 nm. Uniform macroporous surface structure of the film was exposed by SEM images. Existence of iron, strontium and oxygen in the material was confirmed by EDX. Optical characterization of the material was done by UV-Spectroscopy and band gap was found as 3.2 eV. The liquefied petroleum gas (LPG) sensing behavior of strontium ferrite film was investigated at room temperature. The variations in electrical resistance of the film were measured with the exposure of LPG with respect to time as a function of concentration (0.5–5 vol.%) of LPG. The maximum value of sensitivity for these films was found 7 and maximum sensor response was 602.23.

1. Introduction

Surface to volume ratio and quantum confinement elucidate to nanostructure of materials. Ferrites are basically a class of materials which contains iron oxides having fascinating magnetic and electric properties [1]. These are prepared by sintering various transition metal oxides along with the alkaline earth metal oxide. Development of new class of ferrites, and studies on improvements in their properties began in early 90's. On the basis of technological application, magnets are distinguished as soft magnetic materials and hard magnetic materials [2]. Soft magnetic materials are those magnetic materials whose domains shift when magnetic field is applied and hard magnetic materials are those with less mobility of domain wall. Magnetized hard ferrites possess hexagonal structure with high value of magnetization and magnetocrystalline anisotropy so these are termed as M phase ferrites, with M as Ba, Sr or Pb [3,4]. $SrO\text{-}Fe_2O_3$ binary system has few ternary oxides including $SrFe_{12}O_{19}$, $SrFe_2O_4$, $Sr_2Fe_2O_5$ and $Sr_3Fe_2O_6$. Among these, $SrFe_{12}O_{19}$ has attracted the attention of most of the researchers due to its vast area of applications beside a stable characteristic-sand having high electrical resistivity. Strontium ferrite contains strontium and iron where strontium is S block element belonging to group 2 period 5 with $5s^2$ electronic configuration and iron belonging to d-block element group 8 period 4 with electronic configuration $3d^64s^2$ [5]. Crystal structure of M-phase ferrite is complex but can be described as hexagonal with unique axis. $SrFe_{12}O_{19}$ posses 64 ions per unit cell along with 11 different symmerty sites. Oxygen atoms are closely packed at interstitial position with Sr and Fe in ten layers along with the C-axis. The iron atoms are positioned at five different crystallographic sites 2a, 2b, 4f, 4k and 12k. Among them 12k, 4k, 2a are on octahedral site, 4f on tetrahedral site and 2b forming trigonal bipyramid surrounding by five oxygen atoms. Strontium ferrite is used for LPG sensing because of relatively high resistance and special magnetic resonance properties for adsorption. In strontium ferrite, there are large interstitial sites which interact with the oxygen molecules in comparison to other ferrites. The dielectric properties of strontium ferrite shed light on the charge carriers which are responsible for charge transport phenomenon. These ferrites can be prepared by different methods viz. as chemical co-precipitation, sol-gel, ball milling, solid state reaction and reverse micelle process [6–10].

Kanagesan et al. prepared the strontium ferrite nano powder by sol-gel method and carried out investigation on the crystalline $SrFe_{12}O_{19}$ powder using XRD. The average particle size was found to be 80–100 nm and its thermal analysis revealed its endothermic and exothermic reaction peaks [11]. T.T.V. Nga et al. investigated

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Growth and characterization of sol–gel processed rectangular shaped nanostructured ferric oxide thin film followed by humidity and gas sensing

B. C. Yadav, K. S. Chauhan, S. Singh, R. K. Sonker, S. Sikarwar & R. Kumar

Journal of Materials Science: Materials in Electronics **28**, 5270–5280 (2017) | Cite this article

Abstract

In the present work nanostructured ferric oxide has been synthesized using sol–gel method. Thin films of ferric oxide were fabricated via spin coating process. The surface of the thin film was scanned by scanning electron microscope that exhibited the surface morphology of ferric oxide nanostructures. The material was also characterized by XRD, Acoustic particle sizer and FTIR. All the particles distributed on the surface have some spaces among them known as pores. These pores serve as adsorption sites for moisture and other gases. EDX confirmed the elements forming the ferric oxide in pure form. The particle size of the ferric oxide was estimated as ~12.2 nm. The pore size of the film was ~50 nm i.e., nature is mesoporous. Annealing effect on the surface morphology was also observed. Humidity sensing, electrical as well as optical of the prepared film was carried out. The results showed the suitability of material for the development of humidity sensors. Variations in resistance with the exposure of LPG were recorded and found that resistance of film increases with the increasing exposure time and concentration of gas. The maximum sensing response of the sensor was recorded as 3.26 for 1000 ppm at room temperature. The response and recovery times of the sensor were found to be ~12 and 9 min, respectively.

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Development of Fe_2O_3–PANI nanocomposite thin film based sensor for NO_2 detection

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ABSTRACT

The iron oxide-polyaniline (α-Fe_2O_3–PANI) films were prepared by spin coating method on various corning glass substrates over Pt inter-digital electrodes (IDEs). The prepared film was characterised using XRD, SEM, AFM, UV-vis and FTIR. Also, it was employed for NO_2 sensing. The nanostructured α-Fe_2O_3–PANI film showed a high sensing response ~2.29×10^2 towards 20 ppm of NO_2 gas. Besides giving the higher sensing response towards NO_2 gas, α-Fe_2O_3–PANI sensor structure was found to be highly selective and exhibited the poor gas sensing response towards other interfering gases including e.g. Acetone, IPA, NH_3, LPG and CO_2. The investigated sensor can be used for the detection of NO_2 at the industrial level.

1. Introduction

Among the nanosized metal oxides that have been the focus of research due to their potential application in electronic devices, maghemite (<alpha>-Fe_2O_3) has attained prominence due to its magnetic, photocatalytic and electrochemical properties [1–4]. The electrical resistance of semiconductor oxides, such as SnO_2, ZnO, TiO_2 and Fe_2O_3, has a strong dependence on the concentration of surrounding gases. Therefore, oxides are commercially designed as chemical sensors to detect the toxic gases [5–10]. With this intention, several methods of preparation of ferric oxides such as co-precipitation, microemulsion, pulsed wire discharge and hydrothermal processes are employed in order to obtain nanostructured powder [11–13]. The sol-gel process has a unique advantage of producing large-surface-area films at low cost, which is useful to enhance the gas sensitivity [14].

Polyaniline (PANI) as a typical conducting polymer has received a great deal of attention recently [15,16]. With regard to the background, using a composite carrier composed of PANI and ferric oxide nanoparticles could combine the excellent properties of ferric oxide and polyaniline, in addition, a synergistic effect might play a role in enhancing the properties of nanocomposite catalysts. They have unique electronic properties due to the π-conjugation present in their backbones and display improved characteristics over conventional sensors based on nanometal oxides. As NO_2 is a toxic and dangerous gas even at very low concentration (≥20 ppm), therefore, there is an urgent need for a reliable and robust gas sensor for the detection of NO_2 [17].

In the present investigation, PANI/α-Fe_2O_3 nanocomposite thin film has been prepared on the corning glass substrate via chemical polymerization method and tested for the electrical response of the thin film to NO_2 gas at room temperature.

2. Experimental

2.1. Synthesis of nanostructures

In this experiment, 0.1 M of iron nitrate ($Fe(NO_3)_3 \cdot 9H_2O$, Aldrich 98% purity) was used as a precursor solution, 0.1 M of monohydrate citric acid solution as legend molecules and 150 ml distilled water as the solvent. The prepared ferric nitrate solution was added to the citric acid solution dropwise with vigorous stirring. The obtained solution was then heated to a temperature from 70 °C to 120 °C, with vigorous stirring until the gel was formed. Such prepared precursor was used to fabricate the thin films on various corning glass substrates over Pt-IDE using spin coating process [18].

For the formation of the powder, the gel was precipitated by adding NH_4OH dropwise. The powder was then dried at 80 °C for 4 h and the crushed powder was annealed at 500 °C for 2 h Fig. 1(a) shows the flow chart of the growth of PANI [19].

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Preparation of PANI doped TiO_2 nanocomposite thin film and its relevance as room temperature liquefied petroleum gas sensor

Rakesh K. Sonker[1,2] · B. C. Yadav[1] · S. R. Sabhajeet[1]

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Abstract Present work reports the utility of PANI doped titanium dioxide thin film prepared by spin coating technique as LPG sensing. Optical properties were studied using UV–Vis absorption spectroscopy and FTIR spectroscopy. The surface morphology and structure of synthesized material were characterized by SEM and XRD analysis, respectively. The structural analysis confirmed the formation of TiO_2–PANI having an average crystallite size 21 nm. Variations in the resistance with exposure of LPG to the sensing element were observed. Sensor response (S) as a function of time was calculated and its maximum value was found as 2.37 towards 2000 ppm of LPG, response time of the sensor was 2 min. The sensor was quite sensitive to LPG and results were found reproducible.

1 Introduction

Liquefied petroleum gas (LPG) contains the hydrocarbons, majority propane, and butane. The lower explosive limit (LEL) as specified by National Institute for Occupational Safety and Health (NIOSH) and Occupational Safety and Health Administration (OSHA) standards for chemical hazards is average 20,000 ppm by volume 2.0% in air. The permissible exposure limit (PEL) for LPG as specified by NIOSH and OSHA standards is 1000 ppm [1]. The various kinds of materials are used for the detection of reducing LPG gas [2]. Among them, semiconducting metal oxides such as titania (TiO_2) [3], tin dioxide [4], copper ferrite [5] and zinc oxide [6] have been studied extensively. TiO_2 as an n-type semiconducting metal oxide with two distinct phases; anatase and rutile, has been used for a broad range of LPG gas sensing [3, 4]. PANI has been prepared by oxidation of the aniline or anilinium salts e.g. aniline hydrochloride or aniline sulphate, in aqueous acidic ambient [7]. It is a p-type semiconducting material [8] and has specific redox nature, controllable conductivity, and considerable thermal stability [9, 10].

In this work, for the first time, TiO_2–PANI nanocomposite thin film was prepared on a corning glass substrate and employed as LPG sensor.

2 Experimental

Titanium tetrachloride ($TiCl_4$), propanol, deionized water (DI), ethanol, aniline, HCl, ammonium persulphate (APS) and ammonium hydroxide used for the sensor preparation were purchased from Sigma Aldrich Chemical Co. with 99.99% purity. 500 ml distilled water was dissolved with 50 ml HCl followed by 8.33 ml Aniline. After vigorous stirring in ice bath, it was indexed as part (I). 18.924 gm APS was mixed in 331 ml distilled water and after vigorous stirring the solution was indexed as part (II). Now Part I was added with part II followed by vigorous stirring for 2 h. A colour less filtrate was obtained. After drying it at 40–50 °C for 4–5 h, emeraldine salt of PANI was prepared. Later it was washed with NaOH and filtered. Filtrate was

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Development of Fe_2O_3–PANI nanocomposite thin film based sensor for NO_2 detection

Rakesh K. Sonker [a b], B.C. Yadav [a]

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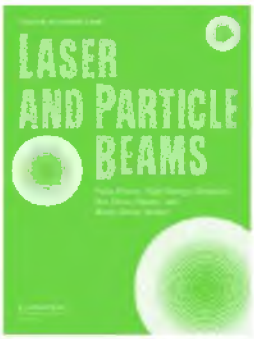
Abstract

The iron oxide-polyaniline (α-Fe_2O_3–PANI) films were prepared by spin coating method on various corning glass substrates over Pt inter-digital electrodes (IDEs). The prepared film was characterised using XRD, SEM, AFM, UV-vis and FTIR. Also, it was employed for NO_2 sensing. The nanostructured α-Fe_2O_3–PANI film showed a high sensing response ~2.29×10^2 towards 20 ppm of NO_2 gas. Besides giving the higher sensing response towards NO_2 gas, α-Fe_2O_3–PANI sensor structure was found to be highly selective and exhibited the poor gas sensing response towards other interfering gases including *e.g.* Acetone, IPA, NH_3, LPG and CO_2. The investigated sensor can be used for the detection of NO_2 at the industrial level.



Laser and Particle Beams

Article contents

Self-compression of two co-propagating laser pulse having relativistic nonlinearity in plasma

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S. Kumar, P. K. Gupta, R. K. Singh, R. Uma and R. P. Sharma

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Abstract

The study proposes a semi-analytical model for the pulse compression of two co-propagating intense laser beams having Gaussian intensity profile in the temporal domain. The high power laser beams create the relativistic nonlinearity during propagation in plasma, which leads to the modification of the refractive index profile. The co-propagating laser beams get self- compressed by virtue of group velocity dispersion and induced nonlinearity. The induced nonlinearity in the plasma broadens the frequency spectrum of the pulse via self-phase modulation, turn to shorter the pulse duration and enhancement of laser beam intensity. The nonlinear Schrodinger equations were set up for co-propagating laser beams in plasmas and have been solved in Matlab by considering paraxial approximation. The propagation characteristics of both laser beams inside plasma are divided into three regions through the critical divider curve, which has been plotted between pulse width τ_{01} and laser beam power P_{01}. Based on the preferred value of critical parameters, these regions are oscillatory compression, oscillatory broadening, and steady broadening. In findings, it is observed that the compression of the laser beam depends on the combined intensity of both beams, plasma density, and initial pulse width.

Keywords

Characteristic beam propagation | Relativistic laser-plasma interaction | Self-compression

Physics Letters A
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Partially synchronized states in an ensemble of chemo-mechanical oscillators

Pawan Kumar, Dinesh Kumar Verma, P. Parmananda

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Highlights

- Collective dynamics of coupled chemo-mechanical oscillators are studied experimentally.
- Two different coupling scenarios are entertained.
- For both the coupling scenarios, the collective dynamics exhibit partially synchronized states.

Abstract

Partially synchronized (clustered) states are defined as coexisting coherent (synchronized) and incoherent (unsynchronized) domains in an ensemble of interacting oscillators. We report these clustered states in experiments involving an ensemble of sixteen mercury beating heart (MBH) oscillators. These oscillators interact via resistors and are subjected to two different network schemes: 1) All to all and 2) Nonlocal. For the all to all network, the coupling strengths were inhomogeneously distributed, whereas for the nonlocal network scenario, each oscillator was coupled, with an identical coupling strength, with four of its nearest neighbors in either direction. For both of these network schemes, partially synchronized states results into grouping of these oscillators, wherein some oscillators are synchronized and rest are unsynchronized. For all to all

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Research Article, Vector Biol J Vol: 2 Issue: 2

Impact of Ocimum Basilicum Leaf Essential Oil on The Survival and Behaviour of An Indian Strain of Dengue Vector, Aedes aegypti (L.)

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ABSTRACT

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[Full Text Article]

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BIOPROSPECTING XYLANASE ENZYMES FROM DIVERSE ECOLOGICAL HABITATS

Payal Das[1], Prateek Kumar[1], Munendra Kumar[1], Renu Solanki[2] and Monisha Khanna Kapur[1]

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ABSTRACT

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Full Length Research Paper

Purification and molecular characterization of chitinases from soil actinomycetes

Payal Das, Prateek Kumar, Munendra Kumar, Renu Solanki and Monisha Khanna Kapur*

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Microbial extracellular chitinases are used in agriculture as effective biocontrol agents and in waste degradation, pharmaceutical and food industry. Actinomycetes are widely tapped group for production of extracellular chitinases. In the present study, approximately 260 actinomycetes were isolated from various ecological habitats was subjected to primary analyses and screened for production of chitinase by plate assay method. Diameter of zones of hydrolysis ranged from 8 to 16 mm. Based on the results, isolates 130, 194, 184, NRRLB 24916 (*Streptomyces mexicanus*) and NRRLB 16746 (*Streptomyces albidoflavus*, positive control) were selected for secondary screening and purification. Enzyme activity was estimated in crude cell free extract and partially purified samples. Activity ranged from 7.16 to 14.12 IU/ml (in crude extracts) and 12.1 to 23.10 IU/ml (in partially purified samples). In case of highest chitinase producing isolate 130, effect of various fermentation conditions (pH, temperature and substrate concentration) was studied in crude extract. Furthermore, complete purification of isolate 130 was done by column chromatography and the activity in purified fraction was found to be 32.12 IU/ml. The K_m and V_{max} values of the purified fractions for isolate 130 were 2.11 µg/ml/min and 53.11mg/ml respectively. This shows that the enzyme has high affinity for the substrate. SDS gel electrophoresis of the purified fraction showed presence of single band of approximately 65 to 70 kDa. Analyses of purified chitinase were done using MS/MS technique. N-terminal sequence corresponded to chitinase, the gene encodes a protein of 453 amino acid residues. Comparison of deduced amino acid sequence to other chitinases in the database indicated that enzyme showed 70% similarity with chitinase from *Streptomyces plicatus* and belongs to glycoside hydrolase family 18. Homology modeling showed that the enzyme was folded into a domain of $(\alpha/\beta)_8$ barrel structure. Identification of secondary structure was done by CD spectroscopy. Isolate 130 was capable of degrading biodegradable wastes such as crustacean shells.

Key words: Actinomycetes, extracellular chitinase, primary screening, secondary screening, purification, MS/MS analyses, homology modelling, protein structure, biodegradation.

INTRODUCTION

Chitinases are enzymes that hydrolyse the β-1,4 linkage of N-acetyl glucosamine present in chitin chains. Due to vast availability, low cost, high stability and productivity, microbial chitinase is attaining prominence for waste management, pest control in agriculture, and human health care (Das et al., 2015, 2016; Rathore and Gupta, 2015). Improving the yield of the enzyme and consequent cost reduction depends on the selection of strains, optimization of fermentation conditions, genetic improvement of strains and kinetic studies of enzyme (Andualem,

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Crystal structure of UDP-*N*-acetylglucosamine-enolpyruvate reductase (MurB) from *Mycobacterium tuberculosis*☆

Kandasamy Eniyan[a,1], Sudhaker Dharavath[b,1], Ramachandran Vijayan[b], Urmi Bajpai[a,*], Samudrala Gourinath[b,**]

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ARTICLE INFO

Keywords:
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ABSTRACT

The biosynthesis of UDP-*N*-acetylmuramic acid (UDP-MurNAc) by reduction of UDP-*N*-acetylglucosamine-enolpyruvate (UDP-GlcNAc-EP) in an NADPH and FAD-dependent reaction in bacteria is one of the key steps in peptidoglycan biosynthesis catalyzed by UDP-*N*-acetylglucosamine-enolpyruvate reductase (MurB). Here, we present the crystal structure of *Mycobacterium tuberculosis* MurB (MtbMurB) with FAD as the prosthetic group at 2.0 Å resolution. There are six molecules in asymmetric unit in the form of dimers. Each protomer can be subdivided into three domains and the prosthetic group, FAD is bound in the active site between domain I and domain II. Comparison of MtbMurB structure with the structures of the *Escherichia coli* MurB (in complex with UDP-GlcNAc-EP) and *Pseudomonas aeruginosa* MurB (in complex with NADPH) showed all three structures share similar domain architecture and residues in the active site. The nicotinamide and the enol pyruvyl moieties are well aligned upon superimposition, both positioned in suitable position for hydride transfer to and from FAD. The comparison studies and MD simulations demonstrate that the two lobes of domain-III become more flexible. The substrates (NADPH and UDP-GlcNAc-EP) binding responsible for open conformation of MurB, suggesting that NADPH and UDP-GlcNAc-EP interactions are conformationally stable. Our findings provide a detail mechanism about the closed to open state by binding of NADPH and UDP-GlcNAc-EP induces the conformational changes of MurB structure that may trigger the MurB catalytic reaction.

1. Introduction

The growth of multidrug-resistant *Mycobacterium tuberculosis* (Mtb) has become an increasing global problem due to acquired resistance to the first and second line drugs [1]. To address the issues of multidrug resistance, discovering drugs with novel modes of action, targeting enzymes deemed specific and essential for the cell wall biogenesis in Mtb recommends a valid approach. Peptidoglycan represents vital constituent of the cell wall in most prokaryotic organisms which provides osmotic stability and defines the size and shape of bacterial cells [2]. Efforts have been made in recent years to study the importance of these enzymes in the peptidoglycan biosynthetic pathway with the hope that novel enzyme inhibitors might be found for these essential targets [3–5].

The cytoplasmic biosynthetic pathway leading to formation of peptidoglycan units involves six enzymes [6,7]. First, UDP-GlcNAc enolpyruvyl transferase, MurA catalyzes the formation of UDP-GlcNAc enolpyruvate by transferring enolpyruvate (UDP-GlcNAc-EP) from phosphoenolpyruvate followed by UDP-GlcNAc enolpyruvate reductase (EC:1.3.1.98, MurB) reaction which catalyzes the reduction of UDP-GlcNAc-EP to form UDP-*N*-acetylmuramic acid (UDP-MurNAc). Then a series of Mur ligases (MurC-F) catalyze the sequential addition L-Alanine, D-Glutamic acid, meso-diaminopimelic and the dipeptide D-Alanine-D-Alanine to UDP-MurNAc, to form the final UDP-MurNAc-pentapeptide. MurB enzyme is essential for the viability of bacterial cells [7] and the absence of a homologue in eukaryotic cells makes MurB

Abbreviations: UDP-GlcNAc-EP, UDP-*N*-acetylglucosamine-enolpyruvate; UDP-MurNAc, UDP-*N*-acetylmuramic acid; FAD, Flavin Adenine Dinucleotide; NADPH, Nicotinamide Adenine Dinucleotide Phosphate; MtbMurB, *Mycobacterium tuberculosis* UDP-*N*-acetylglucosamine-enolpyruvate reductase; EcMurB, *Escherichia coli* UDP-*N*-acetylglucosamine-enolpyruvate reductase; PaMurB, *Pseudomonas aeruginosa* UDP-*N*-acetylglucosamine-enolpyruvate reductase

☆ Databases: The atomic coordinates and structure factors have been deposited in the Protein Data Bank, www.pdb.org (PDB ID code 5JZX).

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Abstract

Bacteriophages are being considered as a promising natural resource for the development of alternative strategies against mycobacterial diseases, especially in the context of the wide-spread occurrence of drug resistance among the clinical isolates of *Mycobacterium tuberculosis*. However, there is not much information documented on mycobacteriophages from India. Here, we report the isolation of 17 mycobacteriophages using *Mycobacterium smegmatis* as the bacterial host, where 9 phages also lyse *M. tuberculosis* H37Rv. We present detailed analysis of one of these mycobacteriophages — PDRPv. Transmission electron microscopy and polymerase chain reaction analysis (of a conserved region within the TMP gene) show PDRPv to belong to the *Siphoviridae* family and B1 subcluster, respectively. The genome (69 110 bp) of PDRPv is circularly permuted double-stranded DNA with ~66% GC content and has 106 open reading frames (ORFs). On the basis of sequence similarity and conserved domains, we have assigned function to 28 ORFs and have broadly categorized them into 6 groups that are related to replication and genome maintenance, DNA packaging, virion release, structural proteins, lysogeny-related genes and endolysins. The present study reports the occurrence of novel antimycobacterial phages in India and highlights their potential to contribute to our understanding of these phages and their gene products as potential antimicrobial agents.

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Publication: Canadian Journal of Microbiology • 15 March 2018 • https://doi.org/10.1139/cjm-2017-0387

Abstract

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Review Article

Microwave Assisted Synthesis of Spiro Heterocyclic Systems: A Review

Author(s): Pankaj Khanna, Leena Khanna, Sean J. Thomas, Abdullah M. Asiri and Siva S. Panda*

Volume 22, Issue 1, 2018

Page: [67 - 84] **Pages:** 18

DOI: 10.2174/1385272821666170818161517

Price: $65

Abstract

Background: Microwave irradiation has emerged as a useful synthetic strategy for chemists and drug developers due to enhanced yields, regioselectivity, and faster reaction times. One area of importance in its practice has been the design of spiro compounds, which possess great interest on account of their natural occurrence and medicinal capabilities. The increasingly large number of these scaffolds and unlimited amount of methodologies utilized in their preparation have made them good candidates for the microwave assisted approach.

Conclusion: Therefore, this review emphasizes the use of microwave irradiation in the synthesis of spiro heterocyclic compounds.

Keywords: Spiro compounds, heterocycles, microwave, green synthesis.

Graphical Abstract

NO ACCESS

An analysis of replenishment model of deteriorating items with ramp-type demand and trade credit under the learning effect

Archana Sharma, Usha Sharma and Chaman Singh

Published Online: May 13, 2018 · pp 313-342 · https://doi.org/10.1504/IJPM.2018.091668

Abstract

Effective management and control strategies are prerequisites in order to optimise inventory related decisions. Robust replenishment model can reduce overall inventory cost and increase financial surplus for the organisation. Adoption of trade credit strategy for deteriorating items provides economic benefits to the retailer (buyer) in settling the account for the fixed period and boosts the sales of the organisation. Therefore, in this proposed model trade credit is introduced and demands pattern follows ramp-type which is quadratic function of time for decaying items. Shortages are allowed and partially backlogged where the backlogging rate is dependent of waiting time. The inflation factor is also considered to propose realistic environment. Additionally, this study also considered the cost components which are followed by learning curve to improve the total inventory cost with strategic scheduling. Finally, the model is analysed through numerical examples and the sensitivity analysis is performed to test the robustness of the model.

Keywords

ramp-type demand, partial backlogging, learning effect, trade credit, inflation

Previous Article

Next Article

From the journal:
RSC Advances

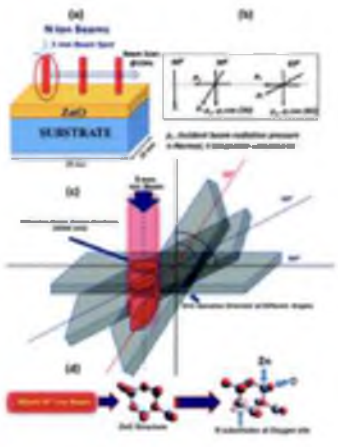
Controlling room temperature ferromagnetism and band gap in ZnO nanostructured thin films by varying angle of implantation

Rajesh V. Hariwal, [*a] Hitendra K. Malik, [b] Ambika Negi [c] and Asokan Kandasami [a]

Author affiliations

Abstract

The defects in the host lattice play a major role in tuning the surface roughness, optical band gap and the room temperature ferromagnetism (RTFM) of ZnO thin films. Herein, we report a novel approach to tailor the band gap and RTFM of a ZnO nanostructure by varying the angle of implantation of 60 keV N ions keeping the ion fluence of 1×10^{16} ions per cm^2 and the beam size of 3 mm constant. The implantation was performed by changing the thin films' orientations at 30°, 60° and 90° with respect to the incident beams. Remarkably, an enhancement of ~6 times in RTFM, tuning in band gap from 3.27 to 3.21 eV and ~60% reduction in surface roughness were noticed when the ion implantation was done at 60° to the normal. This novel technique may be suitable for tuning the physical properties of nanostructures for their application in the spintronics, semiconductor and solar cell industries.



Emamectin benzoate: Potential larvicide and antifeedant agent against cotton Boll worm Helicoverpa armigera (Lepidoptera: Noctuidae)

PDF

Published Jun 1, 2018

DOI https://doi.org/10.31018/jans.v10i2.1738

Vinay Singh Dagar
Department of Zoology, Acharya Narendra Dev College (University of Delhi), Govindpuri, New Delhi, India
Sarita Kumar
Department of Zoology, Acharya Narendra Dev College (University of Delhi), Govindpuri, New Delhi, India

Abstract

Helicoverpa armigera, a global polyphagous pest, attacks a wide variety of crops causing huge agricultural loss. Overuse of conventional insecticides for *Helicoverpa* control has made *Helicoverpa* resistant to insecticides leading to more severe attacks on crops diverting interest of researchers to explore alternate control agents. Present study investigates the cidal and antifeedant potential of Emamectin benzoate; a semi-synthetic avermectin derived from the soil actinomycetes, *Streptomyces avermitilis;* against early IV instars of *H. armigera*. Larvae were fed on the castor leaf discs (3.5 cm diameter) dipped in different concentrations of Emamectin benzoate; ranging from 0.05 µg/mL-1.5 µg/mL. The leaf disc areas were measured pre-and post-larval feeding to estimate the antifeedant potential of compound. The effect of feeding was also assessed on the survival of larvae by scoring the larval mortality till 96 h. Our investigations showed significant larvicidal potential of Emamectin benzoate against *H. armigera* revealing respective LC_{50} values of 0.26 µg/mL, 0.095 µg/mL, 0.043 µg/mL and 0.027 µg/mL after 24, 48, 72 and 96 h feeding. Furthermore, a remarkable decrease of 93.59% was observed in larval feeding potential indicating significant antifeedant efficacy of Emamectin benzoate. A strong correlation between antifeedant index and the Emamectin benzoate concentration resulted in 1.48-fold index reduction with a decrease in concentration. Our results demonstrated efficacy of Emamectin benzoate as an effectual larvicidal and antifeedant agent against *H. armigera*. Employing selective insecticide can tackle issues of pest resistance and pest resurgence after ascertaining in the fields as *Helicoverpa* control agent and negating impact on non-target organisms.

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Molecular and Cellular Biology >
Volume 38, 2018 - Issue 2

Research Article

Sld5 Ensures Centrosomal Resistance to Congression Forces by Preserving Centriolar Satellites

Manpreet Kaur, Raksha Devi, Tanushree Ghosh, Md Muntaz Khan, Praveen Kumar, Priyanka, ...show all

Article: e00371-17 | Received 08 Jul 2017, Accepted 11 Oct 2017, Published online: 03 Mar 2023

Download citation

https://doi.org/10.1128/MCB.00371-17

Study of effect of various temperatures on the abundance of ammonia oxidizing archaea and bacteria

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https://doi.org/10.56093/ijans.v88i5.80023

Keywords: Ammonia, amoA gene, Archaea, Bacteria, Recirculating system, Temperature

Abstract

Temperature plays significant role in the oxidation of ammonia in filtration units of recirculating aquaculture system. The impact of temperature on the abundance of ammonia oxidizing archaea and bacteria, and the expression of ammonia oxidizing gene (amoA) at specific temperature was evaluated. The broken earthen pot pieces used as filter bed materials of recirculating system, showing the presence of microorganisms were introduced in glass containers (5 pieces/5l) filled with synthetic wastewater and exposed to four different temperatures of 10, 20, 30 and 40°C for 40 days. The ammonia oxidation rate was minimum at 10°C. In 20, 30 and 40°C treatments, 99% ammonia was reduced on day-18, 8 and 18, respectively compared to the initial day. Fresh ammonium chloride (2 mM) was added twice to maintain the ammonia concentration in all treatments, except 10°C one. Nitrite-N level was < 1 mg/l at 10°C. The level was highest on day-22 at 20° and 40°C and on day-12 at 30°C. The nitrification was 10 days delayed at 20°C and 40°C compared to 30°C treatment. Concentration of nitrate-N was lowest at 10°C. Highest concentration of nitrate-N was observed on day-40 at 20°C and 40°C and day-26 at 30°C. Highest copy number of bacterial amoA was recorded at 30°C (2.59×107) followed by 20°C (4.08×106), 40°C (1.45×106) and 10°C (5.664×103). Archaeal amoA was highest at 30°C (7.47×103) followed by 40°C (2.98×102) and 20°C (46.8) treatments. Hence it may be concluded that 30°C temperature was optimum for the efficient and faster oxidation of ammonia in the present recirculating system.

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Section
Articles

Citation

Communications in Statistics - Theory and Methods >
Volume 47, 2018 - Issue 7

Original Articles

Estimating the parameter of selected uniform population under the squared log error loss function

K. R. Meena, Mohd. Arshad & Aditi Kar Gangopadhyay

Pages 1679-1692 | Received 15 Sep 2016, Accepted 25 Apr 2017, Accepted author version posted online: 09 May 2017, Published online: 27 Sep 2017

https://doi.org/10.1080/03610926.2017.1324986

JOURNAL ARTICLE

Cellular and molecular basis of heavy metal-induced stress in ciliates

Sripoorna Somasundaram, Jeeva Susan Abraham, Swati Maurya, Seema Makhija, Renu Gupta, Ravi Toteja

Current Science, Vol. 114, No. 9 (10 May 2018), pp. 1858-1865 (8 pages)

https://www.jstor.org/stable/26495334

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Plant Biology / Volume 20, Issue 3 / p. 546-554

Research Paper

Floral contrivances and specialised pollination mechanism strongly influence mixed mating in *Wrightia tomentosa* (Apocynaceae)

C. Barman, V. K. Singh, S. Das, R. Tandon

First published: 13 January 2018
https://doi.org/10.1111/plb.12690
Citations: 9

Abstract

- Reproductive success of a plant species is largely influenced by the outcome of mating pattern in a population. It is believed that a significantly larger proportion of animal-pollinated plants have evolved a mixed-mating strategy, the extent of which may vary among species. It is thus pertinent to investigate the key contributors to mating success, especially to identify the reproductive constraints in depauperate populations of threatened plant species.
- We examined the contribution of floral architecture, pollination mechanism and breeding system on the extent of outcrossing rate in a near-threatened tree species, *Wrightia tomentosa*. The breeding system was ascertained from controlled pollination experiments. In order to determine outcrossing rate, 60 open-pollinated progeny were analysed using an AFLP markers.
- Although the trees are self-compatible, herkogamy and compartmentalisation of pollen and nectar in different chambers of the floral tube effectively prevent spontaneous autogamy. Pollination is achieved through specialised interaction with moths. Differential foraging behaviour of settling moths and hawkmoths leads to different proportions of geitonogamous and xenogamous pollen on the stigma. However, most open-pollinated progeny were the result of xenogamy (outcrossing rate, tm = 0.68).
- The study shows that floral contrivances and pollination system have a strong influence on mating pattern. The differential foraging behaviour of the pollinators causes deposition of a mixture of self- and cross-pollen to produce a mixed brood. Inbreeding depression and geitonogamy appear to play a significant role in sustaining mixed mating in this species.

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JOURNAL ARTICLE

Relative contribution of reproductive attributes to the density-dependent effects on fruit-set

Vineet Kumar Singh, Chandan Barman, Divya Mohanty, Rajesh Tandon

AoB PLANTS, Volume 10, Issue 2, April 2018, ply019, https://doi.org/10.1093/aobpla/ply019
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Abstract

Reproductive success of a plant species can be affected by the distribution pattern of its conspecifics in a small population. Besides the low mate availability, the dynamics of breeding system and pollination mechanism may also contribute to low fruit-set in such populations. We examined the relative contribution of these reproductive attributes on fruit-set across the contrasting distribution pattern (denser vs. sparser plots) in two isolated natural populations of a near-threatened tree species, *Anogeissus sericea* var. *nummularia*. Although flowers in the species are of generalist type, the narrow stigmatic surface appears to impose a requirement for a specialist pollinator. Pollination in the tree species is mediated only by the flies. The trees exhibit partial selfing and suffer from strong inbreeding depression at the early life-history stages of the selfed progeny. We recorded significant difference between the denser and sparser plots in terms of inflorescence visits per tree, and the number of trees covered in a bout by the pollinators. Moreover, tree density showed a strong positive correlation with fruit-set. Besides the requirement of having proximity among the conspecifics to facilitate pollinator movement, pollen quality also seemed to be a crucial attribute in the reproductive success of the tree species. It is inferred that the mating pattern and fecundity of plants in small and isolated populations are significantly influenced by the extent of sexual incompatibility and magnitude of their dependence on pollinators.

Keywords: Inbreeding depression, myophily, partial self-compatibility, reproductive biology
Subject: Plant-Animal Interactions, Reproductive Biology
Issue Section: Research article

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Revue Roumaine de Chimie
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2018, *63*(4), 299-307

HETEROLEPTIC METAL(II) COMPLEXES OF CURCUMIN AND 2,2'-BIPYRIDINE: SYNTHESIS, CHARACTERIZATION, MOLECULAR MODELING AND PRELIMINARY ANTIMICROBIAL INVESTIGATION

Shyam LAL,[a] Mukesh Chandra JOSHI[b], Sunita HOODA[a] and Vikrant KUMAR[a]*

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Received September 18, 2017

Three mononuclear metal complexes [(curcu)M(bpy)]Cl **1-3** of nickel[II] **(1)**, copper[II] **(2)** and zinc[II] **(3)** derived from curcumin (curcu) and 2,2'-bipyridine (bpy) have been isolated and characterized by analytical and spectral methods, *viz.* elemental analyses, molar conductance, magnetic susceptibility measurements, mass spectrometry, IR, UV-visible spectrometry and molecular modeling studies. IR spectral frequencies exhibited curcumin and 2,2'-bipyridine both behave as bidentate ligand and coordinate to metal ion through the carbonyl oxygen and nitrogen atoms respectively. All the complexes showed molar conductance corresponding to 1:1 electrolytic nature. Ni^{II} and Cu^{II} complexes were confirmed possessing square planar geometry however Zn^{II}, tetrahedral. Metal complexes along with curcumin and 2,2'-bipyridine were examined against the opportunistic pathogens. The results obtained indicate that metal complexes have reasonable antimicrobial potential.

INTRODUCTION

Naturally occurring phenolic pigment, Curcumin; chemically, [1,7-bis(4-hydroxyl-3-methoxyphenyl)-1,6-heptadiene-3,5-dione] is a major component of the Curcuma species. It is obtained from the rhizome of *Curcuma longa* Linn.,[1] which is commonly used as a yellow coloring and flavoring agent in foods. Recent studies have shown that curcumin possesses a specific property of binding to metals and as a multipotent agent for combating to potent biological as well as pharmacological activities.[2-8] Thus, for the past decade curcumin as a ligand has been the subject of great interest in modern coordination chemistry.[9-12] Curcumin has a specific chemical motif, a bis-α,β-unsaturated-β-diketone which exhibits keto-enol tautomerism (**Figure 1**). The virtue of coordination property of curcumin leads to tailoring a rational drug design including a number of metal complexes and scavenge the active free-radicals which makes it a more potent bioactive agent *viz.* as antimicrobial agent, anticarcinogenic, antialzheimer, used in catalysis, radiodiagnostic and several other applications.[13-17] Research analysis postulates that the biological properties of curcumin are significantly enhanced upon coordination with metal ion.[18-19] On the other hand, heterocyclic compounds such as pyridine, phenanthroline, bipyridine, and their respective derivatives etc. have been shown extended biological activities when coordinated with metal ion.[20-21] Various enzymes, vitamins, proteins and other life regulating biomoleeules, most of which consist of N- and/or O- containing heteroatoms which are the key of chelation with transition metal ions.

Thus, specific biological and pharmacological role of curcumin, bypiridine and various role of transition metal ions in daily life, could have made

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Journal of Photochemistry and Photobiology A: Chemistry
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A highly selective sensor for Cu^{2+} and Fe^{3+} ions in aqueous medium: Spectroscopic, computational and cell imaging studies

Shyam Lal [a], Satish Kumar [b], Sunita Hooda [a], Pramod Kumar [c]

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https://doi.org/10.1016/j.jphotochem.2018.07.021

Abstract

A rationally designed chemosensor L1 (2-(2-amino-4,5-dihydrothiazol-4-yl)-5,5-dimethylcyclohexane-1,3-dione) is capable for the detection of biologically important Cu^{2+} and Fe^{3+} ions. The observable change in absorbance and emission in HEPES buffer solution and binding parameters display notable sensing ability of Cu^{2+} and Fe^{3+} ions. From Job's plot and ESI-MS spectra, 1:1 stoichiometric complexation with Cu^{2+} and Fe^{3+} ions have been established. The chemosensor was also utilized to develop logic gate by reversibility cycles for Fe^{3+} ion by EDTA. In addition, complex formation between the receptor and Cu^{2+}/Fe^{3+} ion was investigated by spectroscopically and computational studies. The cell imaging study indicated that L1 is highly efficient for the detection of Fe^{3+} ion in live cells. The simple synthetic route, multi-stimuli response, regenerative action and solution visualization of the proposed chemosensor potentially make it as excellent sensor for real samples.

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Protective effects of *Aporosa octandra* bark extract against D-galactose induced cognitive impairment and oxidative stress in mice

Siva S. Panda • Adel S. Girgis • Atish Prakash • ... ElSayed M. Shalaby • Nehmedo G. Fawzy • Subhash C. Jain • Show all authors

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Abstract

Aporosa octandra (Buch.-Ham. ex D.Don) Vickery is a native species of India. Different parts of the plant are used for the medicinal purpose by the tribal peoples of south-eastern part of India. However, the biological properties of *A. octandra* have not been studied well. The extracts obtained from the bark of *A. octandra* were evaluated to determine their protective effect on cognitive impairment and oxidative stress in mice induced by D-galactose using the standard protocol. Different dosages of extract **AOE-4** (100, 200, and 300 mg/kg, p.o.) were administered to mice, which were previously treated for six weeks with D-galactose (100 mg/kg s.c.). The D-galactose-induced mice showed significantly impaired cognitive behavior, i.e., oxidative defense, compared to the sham group. Six weeks of treatment with *A. octandra* extract **AOE-4** (100, 200 and 300 mg/kg, p.o.) considerably improved the cognitive behavior and oxidative impairment of mice compared to the control alone (D-galactose). For the phytochemical investigation, the bark of *A. octandra* was successively extracted with dichloromethane and methanol. The chemical constituents of *A. octandra* were isolated by multiple column chromatography and characterized by different spectral analyses. (*R*)-Coclaurine (**AO-5**), an alkaloid, was isolated along with two other compounds from the **AOE-4** extract; three more compounds were also isolated from the **AOE-1** extract of the bark of *A. octandra*. All the compounds were isolated for the first time from the bark of *A. octandra*, and their structures were established by detailed spectral studies. The structure of compound **AO-5** was also investigated and confirmed by X-ray diffraction and DFT studies. This study highlights the protective effect of *A. octandra* bark extract against D-galactose-induced biochemically dysfunction in mice. (*R*)-Coclaurine (**AO-5**) was isolated as one of the major components of *A. octandra* bark from **AOE-4** extract; compound could be further evaluated for the development of new potential

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Social centrality using network hierarchy and community structure

Rakhi Saxena, Sharanjit Kaur & Vasudha Bhatnagar

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Abstract

Several centrality measures have been formulated to quantify the notion of 'importance' of actors in social networks. Current measures scrutinize either local or global connectivity of the nodes and have been found to be inadequate for social networks. Ignoring hierarchy and community structure, which are inherent in all human social networks, is the primary cause of this inadequacy. Positional hierarchy and embeddedness of an actor in the community are intuitively crucial determinants of his importance. The theory of social capital asserts that an actor's importance is derived from his position in network hierarchy as well as from the potential to mobilize resources through intra-community (bonding) and inter-community (bridging) ties. Inspired by this idea, we propose a novel centrality measure social centrality (SC) for actors in social networks. Our measure accounts for—(1) an individual's propensity to socialize, and (2) his connections within and outside the community. These two factors are suitably aggregated to produce social centrality score. Comparative analysis of SC measure with classical and recent centrality measures using large public networks shows that it consistently produces more realistic ranking of nodes. The inference is based on the available ground truth for each tested networks. Extensive analysis of rankings delivered by SC measure and mapping with known facts in well-studied networks justifies its effectiveness in diverse social networks. Scalability evaluation of SC measure justifies its efficacy for real-world large networks.

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Bandwidth Efficient Broadcast Protocols in MANETs: A Review

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PAPER

Structural and optical properties of electrochemically deposited ZnO nanorods by using graphene oxide and ITO as substrate material: a comparative study

Chetna[1], Shani Kumar[1,2], A Garg[2], A Chowdhuri[3], A Jain[4] and A Kapoor[1]

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Materials Research Express, Volume 5, Number 9

Citation Chetna *et al* 2018 *Mater. Res. Express* 5 095024

DOI 10.1088/2053-1591/aad7a5

References

+ Article and author information

Abstract

The present work reports the comparative study of structural and optical properties of ZnO Nanorods grown on Graphene Oxide (GO) and ITO. For this purpose, GO has been successfully synthesized via Hummer's method while electrochemical method has been used for the synthesis of ZnO nanorods. The structural and optical properties of the as-grown samples were studied using FESEM, EDX, XRD, FTIR and Raman spectroscopy. An improvement in density of ZnO nanorods with hexagonal structure is indicated by the FESEM micrographs. XRD analysis confirms that crystal structure of ZnO nanorods is not significantly disturbed by GO, in addition a reduction in lattice strain has been observed for the samples grown on GO. Raman and FTIR spectroscopy has also been performed to probe the structural integration of ZnO crystal structure and the results are in consensus with that of XRD analysis. The study indicates the potential application of GO as substrate material for ZnO nanorods based devices.

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Comparison of water purification properties of Graphene Oxide (GO) membranes with tuned interlayer spacings

Shani Kumar[1,3], Amit Garg[1] and Arijit Chowdhuri[2]

Published 10 October 2018 • © 2018 IOP Publishing Ltd

Materials Research Express, Volume 6, Number 1

Citation Shani Kumar *et al* 2019 *Mater. Res. Express* **6** 015604

DOI 10.1088/2053-1591/aae416

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Abstract

Worldwide researchers are actively engaged in developing materials that exhibit efficient water filtration and advanced contaminant separation properties. Graphene oxide (GO) is one such material that possesses well-defined nanosized pores. Literature reports indicate the advantageous property of GO nanosheets to be properly spaced and stacked into membranes allowing high speed water flow (low frictional) inside. Although precise sieving of ions and molecules is reported using GO membranes but tuning of interlayer spacing by varying the oxidation state during synthesis is yet to be investigated. In the current study three different GO samples have been synthesized by Hummer's method with different degrees of oxidation. XRD analysis is seen to confirm the decrease in interlayer spacing from 0.838 to 0.782 nm as processing temperature (in the last stage) is increased from 50 to 95 °C leading to different degree of oxidation. Water flux is noted to decrease for the GO membrane developed at higher temperature due to reduction in interlayer spacing. It is also observed that temperature of synthesis directly affects the degree of oxidation which in turn influences water purification application ability of the GO membranes. Membrane prepared at 95 °C is seen to exhibit highest dye rejection whilst it returns lowest pure water flux.

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Sonication effect on graphene oxide (GO) membranes for water purification applications

Shani Kumar[1,3], Amit Garg[1] and Arijit Chowdhuri[2]

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Recent literature indicates the use of graphene oxide (GO), derived from 2D material graphene as being the active material in membranes for water purification and desalination applications, mainly because of it exhibiting unique properties including high mechanical strength, excellent chemical stability, strong hydrophilicity, and excellent anti-fouling properties (Dreyer *et al* 2010 *Chem. Soc. Rev.* **39** 228, Dikin *et al* 2007 *Nature* **448** 457 and Koinuma *et al* 2012 *J. Phys. Chem. C* **116** 19822). In the current study, graphene oxide has been synthesized using well established Hummer's method and thereafter utilized as membranes on porous PVDF (polyvinylidene fluoride) support for water purification applications. The effect of sonication time (5 to 60 min) during preparation of graphene oxide membrane has been investigated vis-à-vis water purification abilities of the developed membranes. Related characterizations like dynamic light scattering (DLS), Raman

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Sonication effect on graphene oxide (GO) membranes for water purification applications

Shani Kumar[1,3], Amit Garg[1] and Arijit Chowdhuri[2]

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+ Article and author information

Abstract

Recent literature indicates the use of graphene oxide (GO), derived from 2D material graphene as being the active material in membranes for water purification and desalination applications, mainly because of it exhibiting unique properties including high mechanical strength, excellent chemical stability, strong hydrophilicity, and excellent anti-fouling properties (Dreyer *et al* 2010 *Chem. Soc. Rev.* **39** 228, Dikin *et al* 2007 *Nature* **448** 457 and Koinuma *et al* 2012 *J. Phys. Chem. C* **116** 19822). In the current study, graphene oxide has been synthesized using well established Hummer's method and thereafter utilized as membranes on porous PVDF (polyvinylidene fluoride) support for water purification applications. The effect of sonication time (5 to 60 min) during preparation of graphene oxide membrane has been investigated vis-à-vis water purification abilities of the developed membranes. Related characterizations like dynamic light scattering (DLS), Raman

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Circular restricted three-body problem when both the primaries are heterogeneous spheroid of three layers and infinitesimal body varies its mass

Abdullah A. Ansari, Ziyad Ali Alhussain & Sada Nand Prasad

Journal of Astrophysics and Astronomy **39**, Article number: 57 (2018) | Cite this article

Abstract

The circular restricted three-body problem, where two primaries are taken as heterogeneous oblate spheroid with three layers of different densities and infinitesimal body varies its mass according to the Jeans law, has been studied. The system of equations of motion have been evaluated by using the Jeans law and hence the Jacobi integral has been determined. With the help of system of equations of motion, we have plotted the equilibrium points in different planes (in-plane and out-of planes), zero velocity curves, regions of possible motion, surfaces (zero-velocity surfaces with projections and Poincaré surfaces of section) and the basins of convergence with the variation of mass parameter. Finally, we have examined the stability of the equilibrium points with the help of Meshcherskii space–time inverse transformation of the above said model and revealed that all the equilibrium points are unstable.

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HOME ARCHIVES VOL. 7 NO. 4.41 (2018): SPECIAL ISSUE 41 Articles

An EOQ Model for Deteriorating Items with Selling Price Dependent Exponential Demand for Time Varying Holding and Deterioration Costs

AUTHORS

Sachin Kumar Verma

Mohd. Rizwanullah

Chaman Singh

DOI: https://doi.org/10.14419/ijet.v7i4.41.24294

PUBLISHED: 2018-12-19

Keywords: Deteriorating items, price and time dependent demand, shortages and time varying holding cost, Lead time.

ABSTRACT Research investigation of the past few decades shown that the researchers developed economic order quantity (EOQ) model for perishable items under constant deterioration and constant demand. Though, in actual practice it is not true. This paper involved a representation of an inventory control model, in which perishable items has been taken with a price as well as an exponential dependent demand. The measured items in the model are deteriorating in nature based on time dependent deterioration rate. In the earlier studies the holding cost often treated as a constant, which is not suited to the most of the practical life situations. In real practical situation some kind of items treat holding cost is a function of time, which is increase as the time increases. In this paper, a model is developed which included the time dependent linear holding cost. We have achieved the estimated optimal solution under the given assumption according to the situation. A numerical example is presented to demonstrate the model and the sensitivity analysis of various parameters is approved out for the validation of the proposed method.

REFERENCES

NO ACCESS

A production inventory model with selling price and stock sensitive demand under partial backlogging

Deo Datta Aarya and Mukesh Kumar

Published Online: March 29, 2018 • pp 350-363 • https://doi.org/10.1504/IJMOR.2018.090802

ABOUT

Abstract

In the proposed paper we develop an inventory model for instantaneous deteriorating items with multi variate function of demand rate. Generally, we observe that the demand for any product depends on so many factors, out of which the available stock and selling price are the main factors. So in this paper we have assumed that the demand rate is a function of stock and selling price. The production rate is taken as a function of demand rate. The shortages are allowed and it is assumed that the occurring shortages will be backlogged for which the backlogging rate is a function of waiting time. The numerical example and sensitivity exploration with respect to various parameters are also cited to illustrate the study.

Keywords

inventory, shortages and partial backlogging, multi variate demand rate, deterioration rate, production

Previous Article

Next Article

RESEARCH ARTICLE

Susceptibility Status of *Aedes aegypti* L. Against Different Classes of Insecticides in New Delhi, India to Formulate Mosquito Control Strategy in Fields

Roopa Rani Samal, Sarita Kumar*
Department of Zoology, Acharya Narendra Dev College, University of Delhi, Kalkaji, Govindpuri, New Delhi 110019, India

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RESEARCH ARTICLE

Effects of *Achyranthes aspera* Extracts on the Survival and Midgut Histo-architecture of *Aedes aegypti* L. Early IV Instars

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Archives of Phytopathology and Plant Protection >
Volume 51, 2018 - Issue 17-18

Original Articles

Growth regulatory and growth inhibitory effects of *Thevetia neriifolia* stem extracts on *Helicoverpa armigera* (Lepidoptera: Noctuidae)

Monika Mishra, Kamal Kumar Gupta & Sarita Kumar

Pages 895-914 | Received 05 Apr 2017, Accepted 24 Aug 2018, Published online: 28 Oct 2018

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Original Paper

Modelling of Pinning-Depinning Reversal Mechanism in Ion-Irradiated Co/Al_2O_3 Thin Films

Rajan Goyal, Rekha Gupta, Ambika Negi, Kandasami Asokan, Dinakar Kanjilal, Subhalakshmi Lamba, Subramanian Annapoorni

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Abstract

Present study reports the pinning–depinning mechanism in Co embedded Al_2O_3 matrix subjected to Ar^+ ion irradiations. Angular variation studies of the scaled coercivity are carried out and a comparison to existing theoretical models indicates that the dominant reversal mechanism is due to pinning. The origin of pinning is attributed to the displacement of Co atoms from their lattice sites, as a result of ion bombardment. The Monte Carlo simulations suggest that the observed magnetic behavior is well explained by pinning induced strain anisotropy in the system.

Conflict of Interest

The authors declare no conflict of interest.

Published: 21 May 2018

Polarization dependent charge control model for microwave performance assessment of AlGaN/GaN/AlGaN double heterostructure HEMTs

Nisha Chugh, Monika Bhattacharya, Manoj Kumar, S. S. Deswal & R. S. Gupta

Journal of Computational Electronics **17**, 1229–1240 (2018) | Cite this article

Abstract

An accurate polarization dependent charge control-based analytical model is proposed for microwave performance assessment of $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ double heterostructure high electron mobility transistors (DH-HEMTs) in terms of current, transconductance, gate capacitances and cutoff frequency. An analytical expression correlating the sheet carrier concentration in the two 2DEGs formed at the upper and lower heterointerfaces of a DH-HEMT is obtained. AlGaN/GaN/AlGaN DH-HEMTs are found to exhibit superior RF performance as compared to its single heterostructure counterpart in terms of higher drain current, improved transconductance, higher gate capacitance and higher unity-gain cutoff frequency. This improvement in the DH-HEMT is mainly attributed to the formation of two 2DEGs (at top and the bottom heterointerface) as compared to the single 2DEG in a SH-HEMT. The variation of drain current with drain voltage and with gate voltage of AlGaN/GaN SH-HEMTs and AlGaN/GaN/AlGaN DH-HEMTs is obtained analytically and found to agree reasonably well with that obtained using ATLAS 2D device simulation, thereby validating the proposed model.

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Abstract

LARVICIDAL ACTIVITIES OF PETROLEUM ETHER EXTRACTS OF DIFFERENT FRUIT PEEL WASTES AGAINST AN INDIAN STRAIN OF FILARIAL VECTOR, CULEX QUINQUEFASCIATUS SAY (DIPTERA: CULICIDAE)

Shrankhla and Sarita Kumar*

ABSTRACT

Objective: The larvicidal activity of the petroleum ether extracts of different fruit peels was assessed against the early fourth instar of Culex quinquefasciatus (Cx. quinquefasciatus). Methods: Petroleum ether extracts of peels of six common fruits were prepared and evaluated against early fourth instar larvae of Cx. quinquefasciatus using WHO standard procedure. The results were statistically analyzed to explore the most efficient extract. Results: Out of the six extracts, the Citrus sinensis and Mangifera indica peel extracts were found the most effective. Other tested fruit peel extracts resulted in 10-80% larval mortality after 24 to 48 hours of exposure. The larvicidal bioassays with C. sinensis resulted in LC50 and LC90 values were 31.345 ppm and 75.313 ppm, respectively as compared to high LC50 and LC 90 values of 195.97 ppm and 633.05 ppm obtained with M. indica. Conclusions: The petroleum ether extract of C. sinensis peels was found as the most effective extract against early fourth instar of Cx. quinquefasciatus amongst the other tested fruit peel extracts. Further investigations are needed to identify the bioactive component and formulate control strategies.

Keywords: Citrus sinensis, Culex quinquefasciatus, Fruit peels, Larvicidal potential, Mangifera indica.

[Full Text Article]

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[Full Text Article]

Review

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Role of gold and silver nanoparticles in cancer nano-medicine

Heerak Chugh [1], Damini Sood [1], Ishita Chandra [1], Vartika Tomar [1], Gagan Dhawan [2], Ramesh Chandra [1] [3]

Affiliations + expand

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Abstract

Development of nanoparticles (NPs) as a part of cancer therapeutics has given rise to a new field of research - cancer nanomedicine. In comparison to traditional anti-cancer drugs, NPs provide a targeted approach which prevents undesirable effects. In this communication, we have reviewed the role of gold and silver NPs (AgNPs) in the cancer nanomedicine. The preparation of gold NPs (AuNPs) and AgNPs can be grouped into three categories - physical, chemical and biological. Among the three approaches, the biological approach is growing and receiving more attention due to its safe and effective production. In this review, we have discussed important methods for synthesis of gold and AgNPs followed by techniques employed in characterization of their physicochemical properties, such as UV-visible spectroscopy, electron microscopy (TEM and SEM) and size and surface analysis (DLS). The mechanism of formation of these NPs in an aqueous medium through various stages - reduction, nucleation and growth has also been reviewed briefly. Finally, we conclude our review with the application of these NPs as anti-cancer agents and numerous mechanisms by which they render cancer cell toxicity.

Keywords: Nanoparticles; cancer; cancer nanomedicine; gold

THE DELHI UNIVERSITY
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The Delhi University Journal of Undergraduate Research and Innovation, a peer-reviewed, open access, e-journal with an ISSN: 2395-2334, an initiative of University of Delhi and the first of its kind for reporting quality research at the undergraduate level in India. It has been instrumental in encouraging young minds to develop creative as well as analytical thinking abilities and inculcating a research culture at the undergraduate level. The Journal provides an apt platform for reporting significant findings of research at the undergraduate level for both college teachers

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Article

A concise synthesis of 2-alkenyl-3-phenyl-4H-chromen-4-ones via novel C-C bond formation using sulfone as potential intermediate

Jul 2018 · Indian Journal of Chemistry -Section B · Indian Journal of Chemistry -Section B

Leena Khanna Pankaj Khanna
Subhash C Jain

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of the Royal Astronomical Society

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Article Navigation

JOURNAL ARTICLE

Geometry of the Large Magellanic Cloud using multiwavelength photometry of classical Cepheids

Sukanta Deb, Chow-Choong Ngeow, Shashi M Kanbur, Harinder P Singh, Daniel Wysocki, Subhash Kumar

Monthly Notices of the Royal Astronomical Society, Volume 478, Issue 2, August 2018, Pages 2526–2540, https://doi.org/10.1093/mnras/sty1124

Published: 03 May 2018 **Article history**

ABSTRACT

We determine the geometrical and viewing angle parameters of the Large Magellanic Cloud (LMC) using the Leavitt law based on a sample of more than 3500 common classical Cepheids (FU and FO) in optical (V, I), near-infrared (JHK_s), and mid-infrared ($[3.6]$ μm and $[4.5]$ μm) photometric bands. Statistical reddening and distance modulus free from the effect of reddening to each of the individual Cepheids are obtained using the simultaneous multiband fit to the apparent distance moduli from the analysis of the resulting Leavitt laws in these seven photometric bands. A reddening map of the LMC obtained from the analysis shows good agreement with the other maps available in the literature. Extinction-free distance measurements along with the information of the equatorial coordinates (α, δ) for individual stars are used to obtain the corresponding Cartesian coordinates with respect to the plane of the sky. By fitting a plane solution of the form $z = f(x, y)$ to the observed three-dimensional distribution, the following viewing angle parameters of the LMC are obtained: inclination angle $i = 25.^\circ 110 \pm 0.^\circ 365$, and position angle of line of nodes $\theta_{\rm lon} = 154.^\circ 702 \pm 1.^\circ 378$. On the other hand, modelling the observed three-dimensional distribution of the Cepheids as a triaxial ellipsoid, the following values of the geometrical axes ratios of the LMC are obtained: 1.000 ± 0.003: 1.151 ± 0.003: 1.890 ± 0.014 with the viewing angle parameters: inclination angle of $i = 11.^\circ 920 \pm 0.^\circ 315$ with respect to the longest axis from the line of sight and position angle of line of nodes $\theta_{\rm lon} = 128.^\circ 871 \pm 0.^\circ 569$. The position angles are measured eastwards from north.

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 16 (2018) pp. 12725-12731

Adoption of Free and Open Source Software in India

Ranjan Kumar[1], Subhash Kumar[2], Sanjay K. Tiwari[3]

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Abstract

The significance and robustness of Free and Open Source Software (FOSS) are now well known at stages of development as well as deployment. It's natural to assume that the products of FOSS to be deployed as a preference over the commercially available propriety software. However, proprietary software not only exists but is also thriving. The present paper looks into the aspect of adoption of FOSS, with special emphasis to India. The two natural arena for adoption- Governance and Academia are chosen for study. The policy initiatives, frameworks and challenges in the implementation of FOSS in these two areas are discussed, while giving instances of its successful adoption. The study also discusses in brief the adoption of FOSS in business enterprise, where its adoption is dynamic and accelerated. Several challenges in adoption of FOSS over propriety software are also pointed out.

Keywords: Adoption, FOSS, Proprietary software

INTRODUCTION

The Free and Open Source Software (FOSS) movement attained prominence in the 1980s, primarily to unshackle the restrictions imposed on the use of copy righted software, now known as CSS (Closed Source Software). Today, although one may not be aware, FOSS is actually providing for the computational requirements for a large spectrum of products and services which make the modern, technologically intensive digital life possible. Most of the smart phones (android based), servers and portals, ATMs, supercomputers, databases etc around the world are FOSS driven. In India, two humongous citizen-specific projects – Aadhar's online infrastructure and the railway booking website utilizes the Linux servers. The FOSS provides a myriad of advantages over the CSS at all stages – development, distribution and research, which have been extensively mentioned in the literature [1-5]. Given the intrinsic freedom of usage, customization, propagation and the relative cost effectiveness which all products of FOSS offers, the adoption of FOSS by a country like India could have been a natural and prudent choice as the nation endevours to upscale the use of IT (information technologies) in its pursuit of digital governance. In this context, one may be betting on India becoming the global FOSS hub. It's evident to expect that the India is a fertile ground for the nurturing of a strong and mature FOSS ecosystem. A FOSS ecosystem comprises of a multitude of stakeholders – government, academic institutions like schools and colleges, FOSS solution providers and the FOSS community. Moreover, in India there is no dearth of business opportunities for providing IT solutions to enterprise. This is because India is only next to China in having the largest base of Internet users, notwithstanding the fact that 80 per cent of its population still needs to go online. When this is seen in the background of the availability in the last two decades of large number of reliable and robust FOSS products, which provides solutions for all domains, wherein the CSS have hitherto provided the services (Refer Table 1) the above expectation is certainly not misplaced.

So, where does India stand on the adoption of free software? The adoption of FOSS in India, until now can be described as patchy and sporadic, without a concerted push to adopt FOSS in the daily computational needs of various spheres viz., Governance, academia and business enterprise. However, it must be mentioned here that although the growth of FOSS in India has witnessed a faster rate than the past, the FOSS ecosystem is far from the threshold level of maturity. This has resulted into a narrow user base for FOSS in India. The government's efforts for FOSS adoption have been varied. While some efforts are subtle, voluntary and staggered, some migrations to FOSS have been hard and coercive. In most cases, migration to FOSS are justified from the perspectives of cost and security and its salient features of being participative, egalitarian and democratic is not emphasized sufficiently. While the goal of making India a global hub for FOSS is laudable, it becomes necessary to examine the extent of adoption and the associated challenges in the migration to FOSS for the computational needs of the digital society which we envisage in India. The present paper surveys the extent of adoption of FOSS in the three major areas of the Indian society i.e., Governance, academia and business enterprise. The study also attempts to identify the impediments in each of these spheres which are inhibiting the development of a supportive and mature ecosystem around FOSS which can harness FOSS to its full potential.

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ELSEVIER

Optical Materials

Volume 83, September 2018, Pages 342-347

Spherical growth of nanostructures ZnO based optical sensing and photovoltaic application

Rakesh K. Sonker [a], S. Sikarwar [b], S.R. Sabhajeet [b], Rahul [c], B.C. Yadav [b]

Show more

https://doi.org/10.1016/j.optmat.2018.06.046

Abstract

The present paper reports deviation in the intensity of light transmitted through the film of ZnO spherical nanostructure (SNSs) with the exposure of humidity at room temperature. For this purpose, the precursor of ZnO SNSs was prepared and used for coating thin film on borosilicate substrates. The efficient dye-sensitized solar cells (DSSCs) are promisingly low-cost molecular solar cell devices. ZnO SNSs are promising materials used to use to create photoanodes for DSSCs. The film was then investigated using SEM, HR-TEM, XRD and UV–visible transmittance techniques. Further, it was employed as transmission based optical humidity sensor, the maximum sensitivity of which was found a ~ 1.81 μW/%RH with response and recovery time of 36 s and 124 s respectively. The sensor showed ~97% reproducible results. The fabricated ZnO SPSs based DSSC shows a short circuit current density (J_{sc}) of 3 mA/cm^2, open circuit voltage (V_{oc}) of 0.62 V and efficiency (η) of 1.3% at one sun condition.

Integrated Ferroelectrics >
An International Journal
Volume 194, 2018 - Issue 1: International Symposium on Integrated Functionalities (ISIF 2017), Part II

Section G: Tunable Dielectrics for RF and High Frequency Devices

Study of electrical, dielectric and EMI shielding behavior of copper metal, copper ferrite and PVDF composite

Krishna Kamal Halder, Rakesh K. Sonker, V. K. Sachdev, Monika Tomar & Vinay Gupta

Pages 80-87 | Received 10 Dec 2017, Accepted 16 Jul 2018, Published online: 16 Apr 2019

https://doi.org/10.1080/10584587.2018.1514879

Zn-Doped TiO_2 Nanoparticles Employed as Room Temperature Liquefied Petroleum Gas Sensor

Authors: Sabhajeet, S. R.; Sonker, Rakesh K.; Yadav, B. C.

Source: Advanced Science, Engineering and Medicine, Volume 10, Numbers 7-8, July 2018, pp. 736-740(5)
Publisher: American Scientific Publishers
DOI: https://doi.org/10.1166/asem.2018.2249

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next article

Published: 05 June 2018

Synthesis and investigation of cubical shaped barium titanate and its application as opto-electronic humidity sensor

Samiksha Sikarwar, Rakesh K. Sonker, Anuj Shukla & B. C. Yadav

Journal of Materials Science: Materials in Electronics **29**, 12951–12958 (2018) | Cite this article

Abstract

In the current scenario, nanoscience and nanotechnology are playing a vital role in the upliftment of the quality of human life. The quantum confinement effect that arises at the nano-dimensional particles, changes the properties of the material in a drastic way. The present paper reports the successful synthesis of $BaTiO_3$ using rotary evaporator and fabrication of sensing elements by deposition of films on flat borosilicate glass substrates using 2-methoxy ethanol and homogeneous precursor in the ratio of 1:4, 2:4, 3:4 and 4:4. These films were then annealed at 650 °C and characterized through various techniques. Morphological investigation as obtained from SEM reported the cubical clusters and the dimensionality of these clusters, decreases with increase in the concentration of 2-methoxy ethanol. An optical investigation done through UV–Vis spectrum showed the absorbance in the UV range and Tauc plot estimated the optical band gaps of 3.842, 3.854, 3.864 and 3.872 eV for the respective films. Structural information as obtained from XRD of the film having 2-methoxy ethanol and homogeneous precursor in the ratio of 4:4 gave minimum crystallite size of ~ 18 nm. Further, these films were employed as opto-electronic humidity sensor where the maximum sensitivity of the sensing elements was found as 2.15, 2.79, 3.28 and 3.67 μW/%RH respectively. Thus as the concentration of 2-methoxy ethanol in the solution increases, the properties of the material increases and hence the humidity sensing potency also increases.

Optik
Volume 169, September 2018, Pages 166-171

Original research article

Less toxic tin incorporated perovskite solar cell using polymer electrolyte processed in the air

Rahul [a b] ✉, Pramod K. Singh [b], M. Parvaz [a], Sultan Ahmed [a], Rakesh K. Sonker [c], B. Bhattacharya [b], Zishan H. Khan [a] ✉

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https://doi.org/10.1016/j.ijleo.2018.05.064 Get rights and content

Abstract

Perovskite sensitizer materials based solar cell (PSSC) is freshly seemed as warm topic because very soon they achieve higher efficiency (~20%) at incident light intensity 100 mw/cm^2 (1 sun condition). This paper deals the fabrication, characterization as well as application of perovskite material. Perovskite material i.e. MASnCl$_3$(CH_3NH_3SnCl3) was composed by coordinate statement of equimolar convergence of CH_3NH_3Cl and tin $SnCl_2$ in DMF arrangement. It was extra portrayed utilizing different characterization methods like X-Ray diffraction (XRD), UV–vis ingestion spectroscopy and Scanning electron microscope (SEM). PSSC has been fabricated utilizing methyl ammonium tri-tin chloride ($CH_3NH_3SnCl_3$) perovskite and polyethylene oxide (PEO) solid polymer electrolyte(SPE)sandwiched between perovskite working electrode (WE) and platinum counter electrode (CE) and its implementation at room condition has been accounted for in this paper. The fabricated PSSC demonstrates a short out current density (Jsc) of 1.8 mA/cm^2, Voc of 0.48 V, fill factor of 0.68 and efficiency (η) of 0.60% at one sun condition.

AIP Conference Proceedings

RESEARCH ARTICLE | MAY 08 2018

Sol-gel formed spherical nanostructured titania based liquefied petroleum gas sensor

S. R. Sabhajeet; B. C. Yadav; Rakesh K. Sonker

AIP Conference Proceedings 1953, 030078 (2018)
https://doi.org/10.1063/1.5032413

The present work reports the preparation of Titania(TiO_2) thin film by sol-gel technique and its Liquefied Petroleum Gas (LPG) sensing. TiO_2 exists in numerous phases possessing different structural properties like amorphous, anatase or anatase/rutile mixed phases. The structural analysis confirmed the formation of TiO_2 having an average crystallite size 21 nm. SEM showed the regular and porous surface morphology. The band gap of the material was found as 3.65 eV. This film was employed for LPG sensing and variations in resistance with exposure of LPG were observed. Sensor response (S) as a function of time was calculated and its maximum value was found as 2.8 for 4% vol. of LPG with a response and recovery times of 240 sec and 248 sec respectively.

Materials Letters
Volume 223, 15 July 2018, Pages 133-136

ZnO nanoneedle structure based dye-sensitized solar cell utilizing solid polymer electrolyte

Rakesh K. Sonker [a], Rahul [b], S.R. Sabhajeet [c]

Show more

https://doi.org/10.1016/j.matlet.2018.03.199

Abstract

Developing new technologies that could lead to alternatives to the traditional silicon-based solar panels and to efficiently light the world in the future, is critically important because of limited natural petroleum resources. Dye-sensitized solar cells (DSSCs) are promisingly efficient and clean hybrid, organic–inorganic, low-cost molecular solar cell devices. Because of their unique, multifunctional properties, zinc oxide (ZnO) nanostructures are promising materials to use to create photoanodes for DSSCs. ZnO was one of the first metal oxides which used in dye-sensitized solar cells. It exhibits a unique combination of potentially interesting properties such as high bulk electron mobility and probably the richest variety of nanostructures based on a very wide range of synthesis routes. The fabricated ZnO nanoneedle based DSSCs shows a short circuit current density (J_{sc}) of 20 mA/cm^2, open circuit voltage (V_{oc}) of 0.48 V, fill factor (FF) of 0.44 and efficiency (η) of 4.2% at one sun condition.

ELSEVIER

Optics Communications
Volume 427, 15 November 2018, Pages 37-43

Enhancement in self-compression due to co-propagating laser pulse in plasma

Sintu Kumar, Pradeep Kumar Gupta, R. Uma, R.P. Sharma

https://doi.org/10.1016/j.optcom.2018.06.023

Abstract

The study proposes enhancement in self-compression of the laser pulse with relativistic nonlinearity in a plasma. It is presented that, a low-intensity laser pulse can tune the pulse duration and peak intensity of the high-intensity laser pulse. The coupled modified nonlinear Schrodinger equations (MNLS) have been established for both laser pulses in plasma. The enhancement in compression of the high-intensity laser pulse is solved by numerical methods. The nonlinearity of plasma, self-phase modulation (SPM), and group velocity dispersion (GVD) compress the laser pulse to the extremely short duration high peak intensity laser pulse. As a result, it is observed that the compression of the high-intensity laser pulse is highly sensitive to the combined intensity of both laser pulses, plasma density and even a small walkoff between two pulses can affect the high-intensity laser pulse compression.

Physics of Plasmas

AIP Publishing

ARTICLE NAVIGATION

RESEARCH ARTICLE | APRIL 26 2018

Dynamics of focused femtosecond laser pulse during photodisruption of crystalline lens

Pradeep Kumar Gupta ; Ram Kishor Singh; R. P. Sharma

Physics of Plasmas 25, 043121 (2018)
https://doi.org/10.1063/1.5025006 **Article history**

Propagation of laser pulses of femtosecond time duration (focused through a focusing lens inside the crystalline lens) has been investigated in this paper. Transverse beam diffraction, group velocity dispersion, **graded refractive index** structure of the crystalline lens, self-focusing, and photodisruption in which plasma is formed due to the high intensity of laser pulses through multiphoton ionization have been taken into account. The model equations are the modified nonlinear Schrödinger equation along with a rate equation that takes care of plasma generation. A close analysis of model equations suggests that the femtosecond laser pulse duration is critical to the breakdown in the lens. Our numerical simulations reveal that the combined effect of self-focusing and multiphoton ionization provides the breakdown threshold. During the focusing of femtosecond laser pulses, additional spatial pulse splitting arises along with temporal splitting. This splitting of laser pulses arises on account of self-focusing, laser induced breakdown, and group velocity distribution, which modifies the shape of laser pulses. The importance of the present study in cavitation bubble generation to improve the elasticity of the

Vector Biology Journal

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Potential of Nardostachys jatamansi Extracts to Manage Indian Strain of Aedes aegypti: A Novel Approach for Vector Control

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Volume 3, Issue 2, pp 01-11

Gesture Recognizing Smart System

Amrita Kumari, Abhijeet, Aman Sharma, Ankit Kumar Baliyan, Kiran, Ravneet Kaur

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ABSTRACT

For differently abled people like deaf or dumb, communication is a challenge. They make use of sign language which is not easily understandable by others and hence poses severe challenges and inconveniences for them in carrying out their day to day task. This work attempts to bridge the communication gap by designing a device that can convert the user's sign language gestures to visual form. The primary focus of the work is to design a portable, intelligent, smart, and cost-effective system using flex sensors and accelerometer which identifies the extensive hand movements of the differently abled person while communicating using sign language and in effect can facilitate him/her in communicating with others. The portable device can capture the user's sign language gestures, convert it to text and outputs the translated text to PC serial monitor, which can easily be understood and can also be converted to voice to be heard by the normal audience. The work also encompasses the design of mobile application for further assistance to differently abled persons.

Keywords: Arduino, Flex Sensors, Gesture Recognition, Sign Language

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Acrylonitrile copolymer based membrane sensor for selective detection of Pb^{2+} ions in aqueous medium

[1] Shyam Lal, [2*] Sunita Hooda, [3] Amit Kumar, [4] Subodh Kumar, [5] Aarushi Singh, [6] Snigdha Singh, [7*] Ramesh Chandra, [8] Vikrant Kumar, [9] Vandana Uberoi, [10] Geetu Gambhir, [11] Drashya

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Abstract

A lead (II) ion selective sensor has been facilely fabricated from Styrene - Acrylonitrile (SA) copolymer as a neutral carrier, sodium tetra phenyl borate (NaTPB) as an anionic excluder and tri butyl phosphate (TBP) as a plasticizing solvent mediator. Fabricated sensor, over a concentration range of $1x10^{-5}$-$1x10^{-1}$ mol L^{-1} revealed a best Nernstian response for Pb (II) ions with a slope of 39.60 mV/decade. Potentiometric selectivity coefficient values as determined by Fix Interference Method (FIM) and Match Potential Method (MPM) indicated that the electrode has good selectivity of Pb^{2+} ion over other heavy metal ions. The performance of proposed sensor in non aqueous mixtures up to 20 % (v/v) ethanol was satisfactory. The effect of surfactant and detergent on the working of Pb^{2+} ion selective electrode was also studied. The electrode can be used for the determination of lead ion pollution in waste water sample.

Keywords: styrene, acrylonitrile, copolymer, ion selective electrode, potentiometric sensor

Introduction

A large number of heavy metals and their compounds are found in the industrial waste and responsible for the environmental pollution. The major sources of lead wastes are lead battery effluent, paint and leather industry. World Health Organization (WHO) [1] has recognized an action level of 10 ppb (µg/L) for lead in drinking water. Therefore, reliable and convenient determination of lead (II) ion is significantly important and emergent in monitoring human health effects and the environment. Lead is a strong poison and tends to

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A large number of heavy metals and their compounds are found in the industrial waste and responsible for the environmental pollution. The major sources of lead wastes are lead battery effluent, paint and leather industry. World Health Organization (WHO) [1] has recognized an action level of 10 ppb (µg/L) for lead in drinking water. Therefore, reliable and convenient determination of lead (II) ion is significantly important and emergent in monitoring human health effects and the environment. Lead is a strong poison and tends to

might not be available in most analytical laboratories [11]. To monitor lead metal, membrane sensors are well-known analytical tools used for the selective and direct measurement of a wide variety of different ions in complex biological and environmental samples. Potentiometric sensors is a direct method that does not require a pretreatment of samples and has noticeable advantages including simple instrumentation, fast response, wide dynamic range, high analyte selectivity, minimal use of toxic solvents, superior detection limit,

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Acrylonitrile copolymer based membrane sensor for selective detection of Pb^{2+} ions in aqueous medium

[1] Shyam Lal, [2*] Sunita Hooda, [3] Amit Kumar, [4] Subodh Kumar, [5] Aarushi Singh, [6] Snigdha Singh, [7*] Ramesh Chandra, [8] Vikrant Kumar, [9] Vandana Uberoi, [10] Geetu Gambhir, [11] Drashya

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Abstract

A lead (II) ion selective sensor has been facilely fabricated from Styrene - Acrylonitrile (SA) copolymer as a neutral carrier, sodium tetra phenyl borate (NaTPB) as an anionic excluder and tri butyl phosphate (TBP) as a plasticizing solvent mediator. Fabricated sensor, over a concentration range of $1x10^{-5}$-$1x10^{-1}$ mol L^{-1} revealed a best Nernstian response for Pb (II) ions with a slope of 39.60 mV/decade. Potentiometric selectivity coefficient values as determined by Fix Interference Method (FIM) and Match Potential Method (MPM) indicated that the electrode has good selectivity of Pb^{2+} ion over other heavy metal ions. The performance of proposed sensor in non aqueous mixtures up to 20 % (v/v) ethanol was satisfactory. The effect of surfactant and detergent on the working of Pb^{2+} ion selective electrode was also studied. The electrode can be used for the determination of lead ion pollution in waste water sample.

Keywords: styrene, acrylonitrile, copolymer, ion selective electrode, potentiometric sensor

Introduction

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Structure-Guided Design and Development of Potent and Selective Dual Bromodomain 4 (BRD4)/Polo-like Kinase 1 (PLK1) Inhibitors

Shuai Liu, Hailemichael O. Yosief, Lingling Dai, He Huang, Gagan Dhawan, Xiaofeng Zhang, Alex M. Muthengi, Justin Roberts, Dennis L. Buckley, Jennifer A. Perry, Lei Wu, James E. Bradner*, Jun Qi*, and Wei Zhang*

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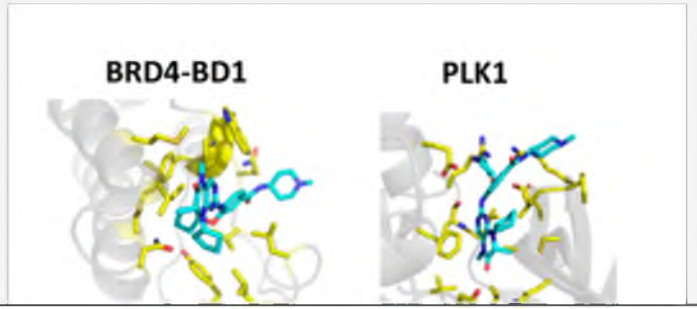
Journal of Medicinal Chemistry

SUBJECTS: Alkyls, Inhibition, Inhibitors,

Abstract

The simultaneous inhibition of polo-like kinase 1 (PLK1) and BRD4 bromodomain by a single molecule could lead to the development of an effective therapeutic strategy for a variety of diseases in which PLK1 and BRD4 are implicated. Compound **23** has been found to be a potent dual kinase–bromodomain inhibitor (BRD4-BD1 IC_{50} = 28 nM, PLK1 IC_{50} = 40 nM). Compound **6** was found to be the most selective PLK1 inhibitor over BRD4 in our series (BRD4-BD1 IC_{50} = 2579 nM, PLK1 IC_{50} = 9.9 nM). Molecular docking studies with **23** and BRD4-BD1/PLK1 as well as with **6** corroborate the biochemical assay results.



Issue 13, 2018

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From the journal:
Green Chemistry

Sequential (3 + 2) cycloaddition and (5 + *n*) annulation for modular synthesis of dihydrobenzoxazines, tetrahydrobenzoxazepines and tetrahydrobenzoxazocines†

Check for updates

Alex Muthengi,[a] Xiaofeng Zhang,[a] Gagan Dhawan,[b] Wensheng Zhang,[c] Francesca Corsini[a] and Wei Zhang *[a]

Author affiliations

Abstract

A two-step method for the (3 + 2) cycloaddition of azomethine ylides followed by a double S_N2 substitution-based (5 + *n*) annulation is introduced for the modular synthesis of dihydrobenzoxazine, tetrahydrobenzoxazepine and tetrahydrobenzoxazocine derivatives. After a quick water wash without further purification, the (3 + 2) cycloaddition intermediates were used for the (5 + *n*) annulation to afford products. Green chemistry metrics analysis of the

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Authors:
Sudha Vipin Sharma*, Sunita Hooda,

Subjects:
Multidisciplinary Academic Research

Year: Nov, 2018
Volume: 15 / Issue: 11
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An Analysis on Recent Technological Developments in Green Chemistry: Biocatalytic Processes | *Original Article*

— Sudha Vipin Sharma*, Sunita Hooda, in *Journal of Advances and Scholarly Researches in Allied Education* | *Multidisciplinary Academic Research*

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ABSTRACT

Enzymes are the most capable catalysts, offering considerably more focused processes contrasted with chemical catalysts. The quantity of modern applications for enzymes has detonated as of late, principally inferable from advances in protein building innovation and environmental and monetary necessities. In this, we audit late advancement in protein biocatalysis, and talk about the patterns and procedures that are prompting more extensive mechanical compound applications. The difficulties and openings in creating biocatalytic processes are additionally talked about. Enzymes as mechanical biocatalysts offer various points of interest over conventional chemical processes as for supportability and process proficiency. Protein catalysis has been scaled up for business processes in the pharmaceutical, nourishment and refreshment enterprises, albeit further upgrades in dependability and biocatalyst usefulness are required for ideal biocatalytic processes in the vitality area for biofuel creation and in gaseous petrol change. The specialized hindrances related with the execution of immobilized enzymes recommend that a multidisciplinary approach is fundamental for the improvement of immobilized biocatalysts relevant in such modern scale processes. In particular, the cover of specialized aptitude in catalyst immobilization, protein and process designing will characterize the up and coming age of immobilized biocatalysts and the effective scale-up of their initiated processes. This audit talks about how biocatalysis has been effectively conveyed, how protein immobilization can enhance modern processes, and in addition centers around the investigation devices basic for the multi-scale execution of compound immobilization for expanded item yield at most extreme market gainfulness and least calculated weight on the environment and client.

KEYWORDS

SIGHTINGS OF *JAMIDES BOCHUS* (STOLL, [1782]) AND *PROSOTAS NORA* (C. FELDER, 1860) (INSECTA: LEPIDOPTERA: LYCAENIDAE) FROM URBANIZED PARTS OF NEW DELHI, INDIA

RAJESH CHAUDHARY* & VINESH KUMAR

Department of Biomedical Science, Acharya Narendra Dev College (University of Delhi), Govindpuri, Kalkaji, New Delhi-110 019.

**Corresponding Author- email: rajeshchaudhary@andc.du.ac.in*

The population of Delhi has increased seventy fold during the last century, with concurrent expansion of urban or concretized landscape (Anonymous, 1912; Anonymous, 2011). Presently, the urbanized portion of Delhi is dotted with numerous parks and gardens harbouring domesticated flora. An evident effect of urbanization of a geographical area is change in the species composition of plants and animals, and, in fact, urbanization introduces novel ecosystems (Lepczyk *et al.*, 2017; Donahue & Lambert, 2015). Insects such as butterflies, which require larval host plants for their survival and are sensitive to the effect of urbanization, can act as an indicator of biodiversity in urban settings (Clark *et al.*, 2007; Fontaine *et al.*, 2016; Dennis *et al.*,

The first partial list of butterflies of Delhi was prepared by Longstaff (1912), mentioning 21 species. An elaborate list of 62 butterflies was made by Jandu (1942, 1943) and Donahue (1967) listed 77 species of butterflies. The list was expanded to include 86 species by Larsen (2002). Recently, a checklist of 115 species of butterflies seen in Delhi was published by Biswas *et al.* (2017). The increase in the butterfly count over time, as evident from these lists, could be the effects of gradual changes in the pattern of floral diversity and habitat due to horticultural practices and urbanization. Alternatively, it may merely be the result of increased observation.

Here, we report the recent sightings of two species of butterflies, *Jamides bochus* (Dark Cerulean) and *Prosotas nora*

Article | Published: 04 May 2018

Occurrence of subdioecy and scarcity of gender-specific markers reveal an ongoing transition to dioecy in Himalayan seabuckthorn (*Hippophae rhamnoides* ssp. *turkestanica*)

Yash Mangla, Kamal Das, Sapinder Bali, Heena Ambreen, Soom Nath Raina, Rajesh Tandon ✉ & Shailendra Goel ✉

Heredity **122**, 120–132 (2019) | Cite this article

Abstract

Dioecy and the dynamics of its evolution are intensely investigated aspects of plant reproduction. Seabuckthorn (*Hippophae rhamnoides* ssp. *turkestanica*) is an alpine shrub growing wild in certain parts of western Himalaya. The previous studies have reported heteromorphic sex chromosomes in the species and yet marker-based studies indicate high

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Archives of Control Sciences
Volume 29(LXV), 2019
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Synchronization of fractional order Rabinovich-Fabrikant systems using sliding mode control techniques

SANJAY KUMAR, CHAMAN SINGH, SADA NAND PRASAD,
CHANDRA SHEKHAR and RAJIV AGGARWAL

In this research article, we present the concepts of fractional-order dynamical systems and synchronization methodologies of fractional order chaotic dynamical systems using slide mode control techniques. We have analysed the different phase portraits and time-series graphs of fractional order Rabinovich-Fabrikant systems. We have obtained that the lowest dimension of Rabinovich-Fabrikant system is 2.85 through utilization of the fractional calculus and computational simulation. Bifurcation diagrams and Lyapunov exponents of fractional order Rabinovich-Fabrikant system to justify the chaos in the systems. Synchronization of two identical fractional-order chaotic Rabinovich-Fabrikant systems are achieved using sliding mode control methodology.

Key words: fractional-order chaotic system, chaos synchronization, Rabinovich-Fabrikant system, Lyapunov exponents

1. Introduction

Chaos, an inevitable phenomenon is the part of nonlinear systems. It is highly sensitive to the initial conditions. This sensitivity is popularly known as the butterfly effect [1]. Since Pecora and Carroll established the concept of chaos synchronization with different initial conditions, it (chaos synchronization) has been received much attention in the field of research. Synchronization of two or more than two chaotic dynamical systems is one of most important applications of chaos. Last several decades, chaos synchronization has been become the research

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An Optimal Policy for Deterministic Model for Time Proportional Deteriorated Inventory with Different Demand Rate Pattern

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Mohd. Rizwanullah, Associate Professor, Department of Mathematics and Statistics, Manipal University, Jaipur, Rajasthan, India.

Chaman Singh, Assistant Professor, Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, Delhi, India.

Abstract--- In this paper, we have formulated an economic order quantity inventory model for a deteriorating item having a twofold deterministic demand rate. The Constant demand rate in the first part of the cycle and the exponential demand rate in the second part of the cycle has been taken. We also considered deterioration rate is time sensitive in nature and Shortages are not the part of this model. A complete solution procedure is provided to demonstrate the proposed model. Also, a numerical example and sensitivity analysis of various unknown parameters illustrated in this model.

Keywords---Constant and Time Dependent Exponential Demand Rate, Deteriorating Items, EOQ, Time Proportional Deterioration Rate.

I. Introduction

In today's competitive world, Mostly business organizations trying to stress on inventory management and their problems, which occurred frequently. It is known that every business organization showing their interest to obtain economic order quantity (EOQ), through which minimized total average inventory cost can be achieved. During the last couple of decades, it has been observed that, many researches working in the direction to control and maintain the inventory in the better and efficient way. In real practical life situation, decay or deterioration of normal talk in now days. Vegetables, fruits, foods are some example of some items having deterioration in nature. As the time increases, deteriorating items keep losing their original value with regard the quantities and qualitative aspect. Therefore, Ignorance of deteriorating factors while analyzing the model leads to harmful results. So it is an unavoidable factor, which should be given attention during the optimization inventory problems Sharma, A. et.al [24] [25] suggested the inventory model in which different demand rate has been taken with a different time interval. Commercial based lot size model for price sensitive dependent demand.

World View | Published: 20 May 2019

Influence of open educational resources on educational practices in the Global South

Sarita Kumar

Nature Human Behaviour **3**, 540–541 (2019) | Cite this article

Open educational resources enable the effective use and sharing of knowledge with those who have been denied an education due to economic or social circumstances. Sarita Kumar outlines how open educational resources can benefit education systems across the Global South by opening up an entire generation to new ideas, technologies and advancements.

22 April 2019

Diminished Activity of Larval Midgut Transaminases and Phosphatases in *Helicoverpa armigera* Hübner (Lepidoptera) Induced by Dietary Stem Extracts of *Thevetia neriifolia*

Monika Mishra, *Kamal Kumar Gupta*, *Sarita Kumar*

Author Affiliations +

The J. of the Lepidopterists' Society, 73(1):23-33 (2019). https://doi.org/10.18473/lepi.73i1.a4

Abstract

Helicoverpa armigera Hübner (Noctuidae) is a common crop pest causing extensive loss of crop yields despite several efforts and diverse measures taken. As utilization of synthetic pesticides in the fields have caused ecological disturbances and lethal effects on humans and organisms; present studies explore *Thevetia neriifolia* (Apocynaceae), a widely used ornamental plant, against *H. armigera* as an alternate control measure. The study investigates the dietary effects of hexane and methanol extracts of *T. neriifolia*

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Original Article | Published: 04 July 2019

Draft genome of *Streptomyces* sp. strain 130 and functional analysis of extracellular enzyme producing genes

Munendra Kumar, Prateek Kumar, Payal Das & Monisha Khanna Kapur

Molecular Biology Reports **46**, 5063–5071 (2019) | Cite this article

518 Accesses | **8** Citations | **1** Altmetric | Metrics

Abstract

Streptomyces sp. strain 130 possesses multiple uncharacterized extracellular enzyme producing genes. Enzymes from these genes may fulfil the intense demand of stable and effective extracellular enzymes in various industries. Taxonomy of *Streptomyces* sp. strain 130 was validated by FAME analysis. Strain 130 was screened for the presence of chitinase producing genes of family 18 and 19 using SC1F/SC2R and F19F2/F19R primer sets respectively. Whole genome sequencing was done using Illumina Next Seq 500 system. In the analysis of draft genome of *Streptomyces* sp. strain 130, the genome size was found to be 7.1 Mb. Blastn and NCBI-conserved domain search tool were used to find similarity percentage with genes in existing database and enzyme family respectively. Ten chitinase, six xylanase and one cellulase producing genes were present in draft genome. Among the ten chitinase

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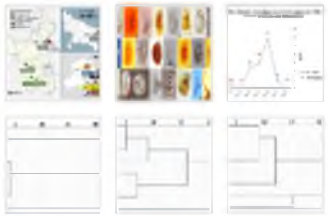

Tables (6)

Saudi Journal of Biological Sciences
Volume 26, Issue 6, September 2019, Pages 1305-1313

Original article

Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as sensitive bio-indicators for soil quality

Jeeva Susan Abraham [a], S. Sripoorna [a], Jyoti Dagar [a], Shiv Jangra [a], Anit Kumar [a], Khushi Yadav [a], Simran Singh [a], Anusha Goyal [a], Swati Maurya [a], Geetu Gambhir [a], Ravi Toteja [a], Renu Gupta [b], Dileep K. Singh [c], Hamed A. El-Serehy [d e], Fahad A. Al-Misned [d], Saleh A. Al-Farraj [d], Khaled A. Al-Rasheid [d], Saleh A. Maodaa [d], Seema Makhija [a]

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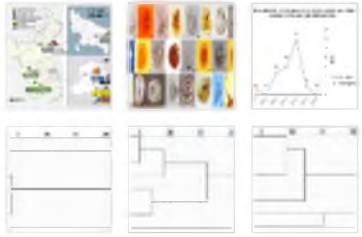
https://doi.org/10.1016/j.sjbs.2019.04.013

Abstract

The present investigation aims to study the diversity of ciliates from different habitats in and around Delhi, India, and the correlation of this diversity with soil quality (agricultural lands (site 1 and 2), dump yards (site 3 and 4), sewage treatment plant (site 5), residential land (site 6), landfill (site 7) and barren land (site 8)). Various physicochemical parameters of the different soil samples were studied and analysed for soil texture, interstitial water, pH, conductivity, total organic carbon, total organic matter, total nitrogen and phosphorous content, using standard protocols. Seventeen ciliate taxa belonging to four classes, seven orders, ten families, and 17 genera were recorded, with the maximum number of species (eleven) belonging to the class Spirotrichea. Ciliate diversity was highest at sites 5 and 6 and lowest at sites 1 and 2. *Spathidium* sp. was the dominant species in the conditioned land (site 8), while the ciliate *Colpoda* sp. was



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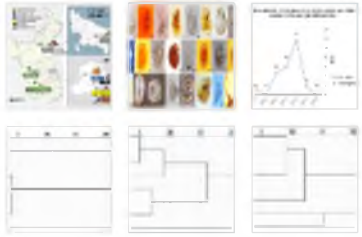

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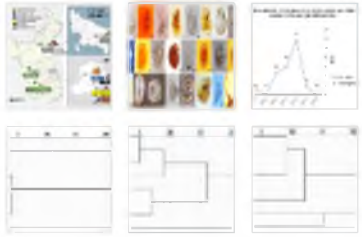

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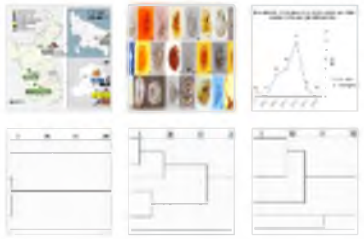

Saudi Journal of Biological Sciences
Volume 26, Issue 6, September 2019, Pages 1305-1313

Original article

Soil ciliates of the Indian Delhi Region: Their community characteristics with emphasis on their ecological implications as sensitive bio-indicators for soil quality

Jeeva Susan Abraham [a], S. Sripoorna [a], Jyoti Dagar [a], Shiv Jangra [a], Anit Kumar [a], Khushi Yadav [a], Simran Singh [a], Anusha Goyal [a], Swati Maurya [a], Geetu Gambhir [a], Ravi Toteja [a], Renu Gupta [b], Dileep K. Singh [c], Hamed A. El-Serehy [d e], Fahad A. Al-Misned [d], Saleh A. Al-Farraj [d], Khaled A. Al-Rasheid [d], Saleh A. Maodaa [d], Seema Makhija [a]

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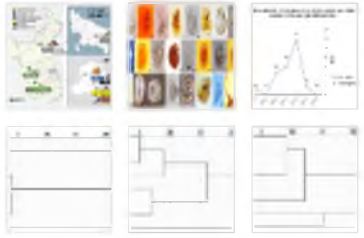

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Reviews

Ferroelectric liquid crystal nanocomposites: recent development and future perspective

Satya Prakash Yadav, Kanchan Yadav, Jayeeta Lahiri & Avanish Singh Parmar

Pages 143-169 | Received 28 Oct 2018, Accepted 27 Feb 2019, Published online: 22 Mar 2019

Download citation https://doi.org/10.1080/21680396.2019.1589400 Check for updates

ABSTRACT

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In recent years, dispersion of nanomaterials in liquid crystal media has attracted a great deal of attention for their applications in various fields and basic understanding. In this regard, nanocomposites of ferroelectric liquid crystals hold a great promise for technological advancement in displays, sensors, development of hybrid materials for optical applications and others. With the emphasis on the properties of ferroelectric liquid crystals, this paper presents a summarizing overview with critical comments on the progress made in last one decade in understanding the influence of nanoparticles on the ferroelectric liquid crystals. The dispersion of nanoparticles in liquid crystal (host material) significantly influences its properties, thereby making the dispersed material more promising for potential applications.

KEYWORDS: Liquid crystals | ferroelectric liquid crystals | nanocomposites | memory effect

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1. Introduction

Over the last few years, much interest has been shown to the study of ferroelectric liquid crystals (FLCs) dispersed with nanomaterials (nanoparticles (NPs), nanorods (NRs), quantum dots (QDs), etc.) of various shapes and sizes because these nanocomposites hold a great promise for the scientific advancement and technological breakthroughs in the applications of LC-based devices [1–18]. The FLCs based devices have been found to be more advantageous over the nematic liquid crystals (NLCs) based devices in terms of

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PAPER

A novel method of electrochemically growing ZnO nanorods on graphene oxide as substrate for gas sensing applications

Chetna [1], Shani Kumar[1,2], A Garg[2], A Chowdhuri[3], A Jain[4] and A Kapoor[1]

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DOI 10.1088/2053-1591/ab16f8

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Abstract

The potential of electrochemically deposited ZnO nanorods using graphene oxide (GO) coated inter digital electrode (IDE) as substrate material for gas sensing applications has been reported. For this purpose, GO solution was synthesized via Hummer's method and coated over IDE of aluminium fabricated on the glass plate. Later ZnO nanorods were deposited on it using electrochemical method. For the structural, morphological and elemental analysis, as-grown nanorods were characterized by

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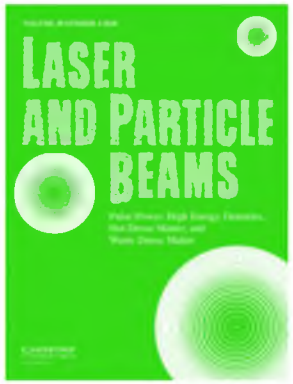

Laser and Particle Beams

Transient setting of relativistic ponderomotive non-linearity and filamentation of ultra-short laser pulses in collisionless plasmas

Published online by Cambridge University Press: **11 July 2019**

R.P. Sharma, Narender Kumar, R. Uma, Ram Kishor Singh and P.K. Gupta

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Abstract

We study the setting up of relativistic ponderomotive non-linearity in an under-dense collisionless cold plasma. Using the fluid model, coupled system of equations of the laser beam and electron plasma oscillations has been derived. We present the numerical simulation for this coupled system of equations, when the coupling arises through relativistic ponderomotive non-linearity. The filamentation of the laser beam has been found to vary appreciably with

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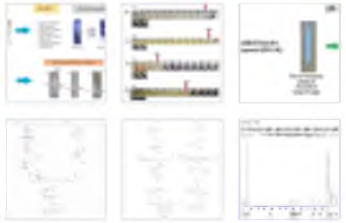

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Table 2

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Exploitation of potential bioactive compounds from two soil derived actinomycetes, *Streptomyces* sp. strain 196 and RI.24

Prateek Kumar [a], Aditi Kundu [b], Munendra Kumar [a], Renu Solanki [c], Monisha Khanna Kapur [a]

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Abstract

Due to emergence of drug resistant pathogens, nearly all available medicines are becoming ineffective against these life threatening pathogens so there is dire need for the discovery of compounds having unique modes of action. During our previous studies, actinomycetes designated as 196 and RI.24 were isolated, screened for bioactive compounds production and characterized using 16S rRNA gene sequencing. Colony 196 was identified as strain of *Streptomyces albolongus* (100% sequence similarity) and RI.24 as strain of *Streptomyces enissocaesilis* (100% sequence similarity). In current study, potential bioactive compounds produced by these strains were characterized. Cold extraction method was applied for taking out of bioactive compounds from actinomycetes. Minimum inhibitory concentration (MIC) determination of compounds from these strains showed activity nearly in the range of commercial antibiotics (strain 196 0.0075 mg/ml, RI.24 0.25 mg/ml and chloramphenicol 0.0075 mg/ml, ampicillin 0.025 mg/ml). Structural elucidation of these compounds was carried out using spectroscopic techniques of LC–MS/MS and ^{1}H NMR. Compounds K-252-*C*-Aglycone, indolocarbazole alkaloid, decoyinine, cycloheximide were detected from strain 196

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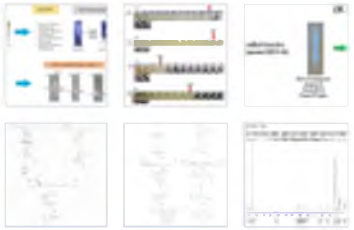

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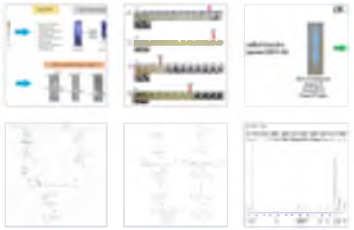

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Original Article | Published: 04 July 2019

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Sripoorna Somasundaram, Jeeva Susan Abraham, Swati Maurya, Ravi Toteja, Renu Gupta & Seema Makhija

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Abstract

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First published: 05 November 2019 | https://doi.org/10.1111/jeu.12773 | Citations: 1

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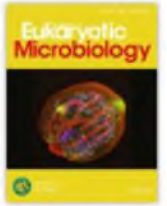

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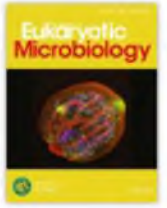

Volume 67, Issue 2
March/April 2020
Pages 296-299

Journal of Eukaryotic Microbiology — Published by the International Society of Protistologists

Symposium Article | Full Access

Symposium Report: International Symposium on Ciliate Biology, India Habitat Centre, New Delhi, India, 04–06 April 2018

Komal Kamra, Harpreet Kaur, Shashi, Jeeva Susan Abraham, Sripoorna Somasundaram, Seema Makhija, Ravi Toteja, Alan Warren, Renu Gupta

First published: 05 November 2019 | https://doi.org/10.1111/jeu.12773 | Citations: 1

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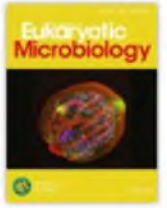

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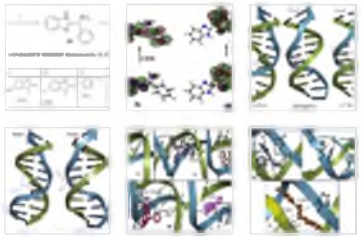

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CellPress

Volume 5, Issue 10, October 2019, e02596

Research Article

Synthesis, DFT studies, molecular docking, antimicrobial screening and UV fluorescence studies on ct-DNA for novel Schiff bases of 2-(1-aminobenzyl) benzimidazole

Sugandha Singhal [a], Pankaj Khanna [b], Leena Khanna [a]

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Abstract

Novel Schiff bases (SBs) were synthesized by condensation of 2-(1-Amino benzyl) benzimidazole with heterocyclic and aromatic carbonyl compounds. The structural characterization was done using ^{1}H, ^{13}C NMR, FTIR and ES-MS spectroscopic techniques. The *in silico* pharmacokinetics showed that nearly all compounds obeyed Lipinski rule of 5 with low toxicity and metabolic stability. The global reactivity descriptors were calculated using DFT approach. The molecular docking result of SBs with ct-DNA suggested interaction *via* groove binding mode. The antibacterial activity was tested against *S.aureus* and *E.coli*, indicated significant inhibition than reference drug. The compound **4d** gave best results at 50 μg ml^{-1} concentrations. UV/Vis and Fluorescence spectroscopy tools were used to evaluate ct-DNA binding ability of compounds **4a–e** through hypochromic shift. The steady state fluorescence predicted a moderate binding constant of 1.12×10^{4} for **4d**, indicative of non-intercalative mode.

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JOURNAL OF HETEROCYCLIC CHEMISTRY

REVIEW

Recent Trends in the Synthesis of Benzimidazoles From *o*-Phenylenediamine *via* Nanoparticles and Green Strategies Using Transition Metal Catalysts

Sugandha Singhal, Pankaj Khanna, Siva S. Panda, Leena Khanna

First published: 27 October 2019 | https://doi.org/10.1002/jhet.3649 | Citations: 10

Abstract

Benzimidazole is a heterocyclic moiety of immense importance as it acts as a primary "biolinker" in diverse synthetic routes to obtain bioactive compounds. Substituted benzimidazoles are known to possess a varied range of pharmacological applications, namely, anti-cancer, anti-diabetic, anti-inflammatory, and antiviral like anti-HIV and anti-fungal. A number of reviews covering the important aspects of benzimidazoles such as pharmacological activities, SAR studies, and well-known methods of synthesis have appeared in the literature. However, green synthetic methods particularly using transition metal (TM) catalysts and their nanoparticles, although being more viable and extensively applied by researchers in the present scenario, have not been exclusively and expansively reviewed. Besides this, the vital precursors required for knitting the skeleton of benzimidazole are mainly *o*-aryldiamines. The conventional synthesis generally involved the condensation of these diamines with carbonyl/carboxylic acid derivatives either *via* high temperature heating or *via* adding strong acids, mostly resulting in poor yields or mixtures. However, recent trends are replacing these conditions by mild and green conditions through TM catalysts. Therefore, the current review emphasizes on the recent trends adopted in the synthesis of benzimidazoles using condensation reaction of *o*-phenylenediamines and various aldehydes/ester/amide/alcohols with TM in a catalytic role in nanoform and under environmentally benign green conditions.

Volume 56, Issue 10
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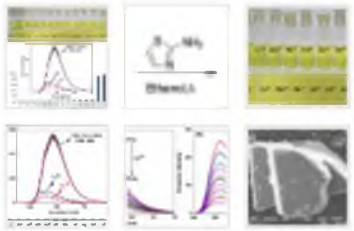

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Journal of Molecular Structure
Volume 1211, 5 July 2020, 128091

Curcumin based supramolecular ensemble for optical detection of Cu^{2+} and Hg^{2+} ions

Shyam Lal [a], Kunal Prakash [b], Nainy Khera [a], Drashya [a], Snigdha Singh [c], Aarushi Singh [c], Sunita Hooda [a], Ramesh Chandra [c]

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Highlights

- Curcumin based fluorescent probe **L1** has selective ability towards Hg^{2+} and Cu^{2+} ion in aqueous solution.
- "Real eye" evaluation of Hg^{2+} and Cu^{2+} ions was observed through paper strips.
- Supramolecular ensembing of Hg^{2+} and Cu^{2+} was confirmed through SEM, PXRD and TD-DFT methods.
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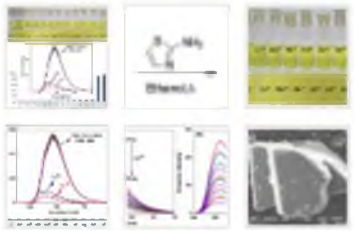

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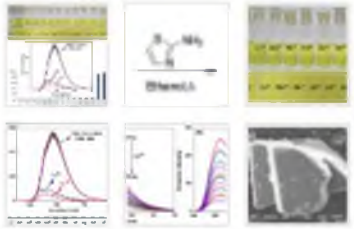

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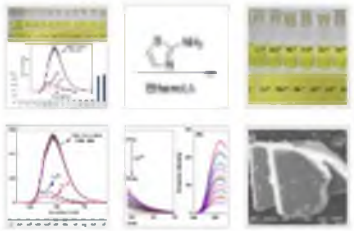

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Repurposing of FDA-approved drugs to target MurB and MurE enzymes in *Mycobacterium tuberculosis*

Jyoti Rani, Yumnam Silla, Kasmika Borah, Srinivasan Ramachandran & Urmi Bajpai

Pages 2521-2532 | Received 03 Apr 2019, Accepted 17 Jun 2019, Accepted author version posted online: 27 Jun 2019, Published online: 11 Jul 2019

Download citation https://doi.org/10.1080/07391102.2019.1637280 Check for updates

Abstract

Tuberculosis (TB), caused by *Mycobacterium tuberculosis* (Mtb) is one amongst the top 10 causes of death worldwide. The growing rise in antibiotic resistance compounded with slow and expensive drug discovery has further aggravated the situation. 'Drug repurposing' is a promising approach where known drugs are examined for a new indication. In the present study, we have attempted to identify drugs that could target MurB and MurE enzymes involved in the muramic acid synthesis pathway (Mur Pathway) in Mtb. FDA-approved drugs from two repositories i.e. Drug Bank (1932 drugs) and e-LEA3D (1852 drugs) were screened against these proteins. Several criteria were applied to study the protein-drug interactions and the consensus drugs were further studied by molecular dynamics (MD) simulation. Our study found Sulfadoxine (−7.3 kcal/mol) and Pyrimethamine (−7.8 kcal/mol) to show stable interaction with MurB while Lifitegrast (−10.5 kcal/mol) and Sildenafil (−9.1 kcal/mol) showed most reliable interaction with MurE. Furthermore, binding free energy (ΔG_{bind}), RMSD and RMSF data and the number of hydrogen bonds corroborated the stability of interactions and hence these drugs for repurposing should be explored

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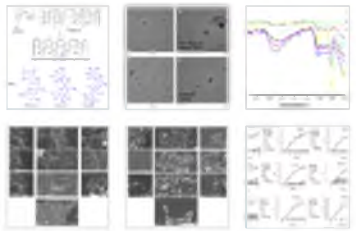

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Volume 107, February 2020, 110284

Polydopamine –aminoglycoside nanoconjugates: Synthesis, characterization, antimicrobial evaluation and cytocompatibility

Indu Singh [a c 1], Ayushi Priyam [b 1], Diksha Jha [a], Gagan Dhawan [c], Hemant K. Gautam [a], P. Kumar [b]

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Highlights

- Polydopamine nanoparticles have been synthesized by oxidative self-polymerization.
- Aminoglycoside-conjugation yielded nanoconjugates.
- These exhibited excellent antimicrobial activity with high cyto-compatibility.
- Nanoconjugates also showed activity against resistant pathogens.

Abstract

Development of nanoparticle- and self-assembled nanomaterial-based therapeutics has become a rapidly growing area in the field of nanotechnology. One of the natural compounds, dopamine, presents as a neurotransmitter in the human brain serving as a messenger and deals with the behavioural responses, has provided an ideal platform

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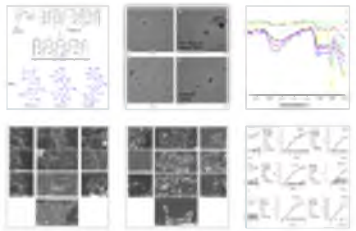

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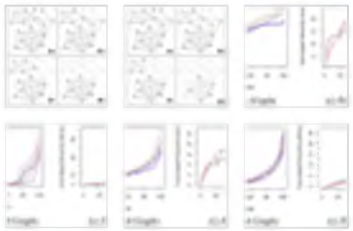

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Abstract

Comparing structural similarities among complex networks is an important task in several scientific and social science applications. Existing techniques for quantifying network similarity range from network-centric methods that consider *global* network topology to node-centric methods that consider *local* node-level sub-structures.

In this paper, we address the research gap between computationally expensive network-centric approaches and myopic node-centric network comparison methods by introducing a novel approach to quantify network similarity based on hierarchical graph decomposition. The approach adequately captures both global and local topology and is motivated by the observation that networks from diverse domains such as physical, chemical, biological and social systems exhibit an inherent structural hierarchy that emerges from local dyadic and triadic interactions. The proposed algorithm, *N*etwork *S*imilarity via graph *D*ecomposition (*NSD*), extracts network signatures from hierarchical decomposition of networks and uses Canberra distance to quantify the similarity between signatures. We use two well-known graph decomposition methods to expose network hierarchy resulting in two variations of NSD. We find that our approach groups similar networks better than competing algorithms. Experimentation using 40 real-world networks, 15 massive networks, and 30 large synthetic networks establishes that the proposed methodology is effective, scalable, sensitive and applicable to wide variety of networks.

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The Impact Of Various Digitized Social Networking Media Through Text, Images And Videos On Language Usage

Sampurnananda Mishra, Chandra Kanta Samal, Navneet Yadav, Rama Kanta Choudhury

Abstract: The catalytic effect of social media on the diurnal course of people of the world has ushered in a new era of globalization. With the teeming multitudes of social media sites offering a universal user-friendly application in multifarious platforms has turned out to be a hunting ground for scholars and researchers from diverse fields. More so, their impact has been conspicuous among the language expounders and educators of today. The world has gone digital with the help of incredible tools of social media where people carry out global business and qualitative services. All the transactions , negotiations and deliberations happen through language conversation as a result of which language teaching and learning have become an indispensible part of social media. The language trainers introduce and execute various tools of social media which devises unique and novel ways of interaction transcending the local boundaries of the school. The notable social networking sites like Facebook, WhatsApp, Aadmodo Linkden, Me too etc equip educators to enhance their instructional skills. These widespread social networking sites offer a plentitude of openings for language educators to sharpen their digital, multi-literacy, linguistic and empirical skills. This paper probes into the theoretical bedrock of social networking in language learning and its effectiveness inside the classroom vis-a-vis the present pedagogy followed by different communities of the world. Further it intends to illuminate the fundamental issues and considerations while using social networking sites in a language classroom.

Keywords: Psycholinguistic approaches, Teeming multitudes, Multifarious platforms, Social networking , World wide web, IOT, Neural network.

1. INTRODUCTION

Information technology is playing a pivotal role in the use of technology in teaching and learning. Social networking has become the prime medium through which creation and transmission of information takes place. Social networking is in a state of flux and constant evolution. In order to facilitate learning and its quality, it has introduced and integrated new technologies like machine learning neural lays and neural network and IOT (Internent of things) to create a universal appeal among the world population irrespective of diversity of language and culture. There are a plethora of organized and unorganized tools which work together to enhance the quality of education. These tools facilitate, provide, engage and aid the process of teaching - learning. Social media can be compartmentalized into seven interconnected categories. (1) social networks (e.g., Facebook, LinkedIn); (2) bookmarking sites (e.g., Delicious, StumbleUpon); (3) social news (e.g., Digg, Reddit); (4) media sharing (e.g.,

1.1 Approaches to Social Networks

Theories on latest technology refer to the development and exploration of tools aimed at examining the plausible advantages in the field they are to be used. The studies are often received with a pinch of salt as they lack proper theoretical and practical framework. But it is an undeniable fact that they initiate the educators to the L2 contexts. These studies also suggest that the new tools would bring about a revolution in the traditional mind set of the existing classrooms. As far as social networking is concerned these tools are employed for learning a language and other social purposes. Studies by Stevenson and Liu, Blyth, prove to be utilitarian for the educators of language and open up avenues for further research.

1.2 Psycholinguistic Approaches

Psycholinguistic approaches to language learning aims at the significance of social interaction and getting noticed. There is a

PHYSICS OF SEMICONDUCTOR DEVICES | Published: 16 December 2019

Analysis of $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ DH-HEMT for RF and Microwave Frequency Applications

Nisha Chugh, Manoj Kumar, Monika Bhattacharya & R. S. Gupta

Semiconductors **53**, 1784–1791 (2019) | Cite this article

123 Accesses | **3** Citations | Metrics

Abstract

A charge control based analytical model is followed to study the impact of donor-layer doping and gate-length on microwave frequency performance of AlGaN/GaN/AlGaN double heterostructure high electron mobility transistor (DH-HEMT). DH-HEMT is observed to be more sensitive to gate-length and doping variation as compared to single heterostructure high electron mobility transistor (SH-HEMT). The effect of gate-length and doping on various performance parameters, i.e., transconductance, drain conductance, cut-off frequency and maximum oscillation frequency has been analysed. The results so obtained are compared with simulation results and are found to be in good agreement.

PERTURBED SIX-BODY CONFIGURATION WITH VARIABLE MASS

ABDULLAH A. ANSARI[1], K. R. MEENA[2], SADA NAND PRASAD[2]

[1] *International Center for Advanced Interdisciplinary Research (ICAIR), Sangam Vihar, New Delhi, India,Email: icairndin@gmail.com*
[2] *Department of Mathematics, Acharya Narendra Dev College, University of Delhi, New Delhi, India*

Abstract. Six-body configuration is investigated with the effects of oblateness, variable mass as well as Coriolis and centrifugal forces, where four equal bodies are placed at the vertices of a square and fifth body is placed at the center of the circle on which the previous four bodies are moving. All five bodies are considered as oblate in shapes where first four bodies have same oblateness while fifth body has different oblateness. There is the sixth smallest body which varies its mass according to Jeans law. The system is also affected with small perturbations in the Coriolis and centrifugal forces. By considering these effects and using the Jeans law as well as Meshcherskii space time transformations, the system of equations of motion for the smallest body is determined. The Jacobian integral and mean motion are also admitted from this system. Further the equilibrium points, motion for forbidden regions and attracting regions are illustrated under the effects of above said parameters. Here twelve equilibrium points are exists out of which four equilibrium points are collinear, four points are on the perpendicular axis and rest four points are in four quadrants separately. Finally, the stability of these equilibrium points are examined by using Meshcherskii space time inverse transformations and found them unstable.

Key words: Perturbed six-body configuration – Coriolis and centrifugal forces – Oblateness – Attracting regions.

PERTURBED SIX-BODY CONFIGURATION WITH VARIABLE MASS

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[2] *Department of Mathematics, Acharya Narendra Dev College, University of Delhi, New Delhi, India*

Abstract. Six-body configuration is investigated with the effects of oblateness, variable mass as well as Coriolis and centrifugal forces, where four equal bodies are placed at the vertices of a square and fifth body is placed at the center of the circle on which the previous four bodies are moving. All five bodies are considered as oblate in shapes where first four bodies have same oblateness while fifth body has different oblateness. There is the sixth smallest body which varies its mass according to Jeans law. The system is also affected with small perturbations in the Coriolis and centrifugal forces. By considering these effects and using the Jeans law as well as Meshcherskii space time transformations, the system of equations of motion for the smallest body is determined. The Jacobian integral and mean motion are also admitted from this system. Further the equilibrium points, motion for forbidden regions and attracting regions are illustrated under the effects of above said parameters. Here twelve equilibrium points are exists out of which four equilibrium points are collinear, four points are on the perpendicular axis and rest four points are in four quadrants separately. Finally, the stability of these equilibrium points are examined by using Meshcherskii space time inverse transformations and found them unstable.

Key words: Perturbed six-body configuration – Coriolis and centrifugal forces – Oblateness – Attracting regions.

Technical Paper | Published: 28 January 2019

Sheet carrier concentration and current–voltage analysis of $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ double heterostructure hemt incorporating the effect of traps

Nisha Chugh, Manoj Kumar, Monika Bhattacharya & R. S. Gupta

Microsystem Technologies **28**, 665–674 (2022) | Cite this article

559 Accesses | **7** Citations | Metrics

Abstract

An analytical approach incorporating traps (donor type) in the AlGaN layer at the top and bottom heterointerface is proposed to determine threshold voltage (V_{th}), net sheet carrier concentration (n_s) and drain current in $Al_{0.15}Ga_{0.85}N/GaN/Al_{0.15}Ga_{0.85}N$ double-heterostructure (DH) high electron mobility transistor (HEMT). Generation of carriers in the 2DEG due to detrapping of these donor traps have been thoroughly studied in the present analysis. Due to traps in the upper and lower AlGaN layer, two 2DEG channels formed, such that n_s in a DH-HEMT is nearly twice as compared to that obtained in single heterostructure (SH). Due to increased 2DEG density, drain current is more in DH-HEMT as compared to SH-HEMT. The effect of incorporation of these donor traps on V_{th}, n_s and drain current of DH-HEMT as compared to SH-HEMT has been studied. The effect of Al mole fraction, AlGaN layer thickness, mobility, trap concentration and temperature on drain current of DH-HEMT as compared to SH-HEMT has also been studied. The analysis has been performed

J Matern Fetal Neonatal Med. 2019 Nov;32(21):3511-3519. doi: 10.1080/14767058.2018.1465914. Epub 2018 May 2.

Cytokine-induced expression of nitric oxide synthases in *Chlamydia trachomatis*-infected spontaneous aborters

Priya Prasad [1], Namita Singh [1], Banashree Das [2], Sheikh Raisuddin [3], Mridu Dudeja [4], Sangita Rastogi [1]

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PMID: 29720007 DOI: 10.1080/14767058.2018.1465914

Abstract

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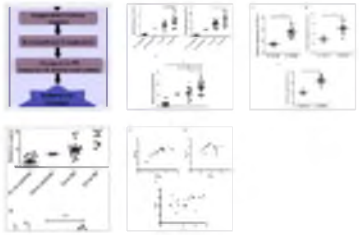

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Microbial Pathogenesis
Volume 142, May 2020, 103994

Does tumour necrosis factor alpha-induced cyclooxygenase-2 expression lead to spontaneous abortion in *Chlamydia trachomatis*-infected women

Namita Singh [a], Priya Prasad [a], Banashree Das [b], Sangita Rastogi [a]

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Highlights

- Study revealed effect of proinflammatory cytokines on *C. trachomatis*-positive SA.
- Increased expression of TNF-α, IFN-γ, IL-8 in ECT of *C. trachomatis*-positive SA.
- TNF-α, IFN-γ and IL-8 expression was significantly higher in RSA *versus* SSA.
- TNF-α and COX-2 were positively correlated with each other in infected aborters.
- Aberration in TNF-α and IFN-γ can induce COX-2 leading to immunopathogenesis of SA.

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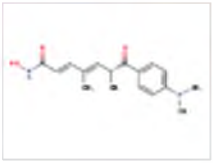

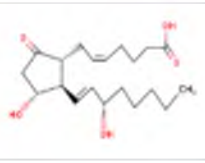

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Hyperoxidation of Peroxiredoxin 6 Induces Alteration from Dimeric to Oligomeric State

Sharifun Shahnaj [1], Rimpy Kaur Chowhan [2], Potshangbam Angamba Meetei [3], Pushpa Kakchingtabam [4], Khundrakpam Herojit Singh [5], Laishram Rajendrakumar Singh [6], Potshangbam Nongdam [7], Aron B Fisher [8], Hamidur Rahaman [9]

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PMID: 30717364 PMCID: PMC6406459 DOI: 10.3390/antiox8020033

Free PMC article

Abstract

Peroxiredoxins(Prdx), the family of non-selenium glutathione peroxidases, are important antioxidant

Biochim Biophys Acta Gene Regul Mech. 2020 Mar;1863(3):194479.
doi: 10.1016/j.bbagrm.2019.194479. Epub 2020 Jan 10.

Prion protein transcription is auto-regulated through dynamic interactions with G-quadruplex motifs in its own promoter

Prashant Pradhan [1], Ankit Srivastava [1], Jasdeep Singh [1], Banhi Biswas [1], Akanksha Saini [1], Ibrar Siddique [2], Pooja Kumari [3], Mohd Asim Khan [4], Akhilesh Mishra [1], Pramod Kumar Yadav [1], Shivani Kumar [1], Neel Sarovar Bhavesh [3], Prasanna Venkatraman [5], Perumal Vivekanandan [6], Bishwajit Kundu [7]

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PMID: 31931179 DOI: 10.1016/j.bbagrm.2019.194479

Abstract

Original Article | Published: 05 March 2019

A study of software reliability on big data open source software

Ranjan Kumar, Subhash Kumar & Sanjay K. Tiwari

International Journal of System Assurance Engineering and Management **10**, 242–250 (2019) | Cite this article

Abstract

With the increasing use of Open Source Software (OSS) in high speed networking, parallel processing and distributed computing, OSS has emerged as mainstream in the last decade and is now being broadly accepted even by the traditional proprietary software development companies. The major advantages of OSS over traditional software development are less development cost, availability of source code, quality and security. Software reliability—an important attribute of software quality, is defined as the probability that a software will operate free of failures or breakdown for a specified time under specified conditions (IEEE Std. 1633-2016). Investigation of Software reliability with the help of software reliability

International Journal of Applied Engineering Research ISSN 0973-4562 Volume 14, Number 9 (2019) pp. 2260-2269

A Case Study on R: a powerful OSS and data analysis platform

Ranjan Kumar[1], Subhash Kumar[2], Sanjay K. Tiwary[3]

Abstract

R, an open source software, has emerged as a powerful tool for statistical computing and data visualization. It is also the favoured programming language for data science in the last decade. Its open source platform has allowed a tremendous growth in its community which has contributed R packages independently. Number of R packages has grown exponentially in the last five years. This paper undertakes a case study of R wherein the popularity of R and its development paradigm is explored, while studying salient features of its organization structure. Statistical inferences are drawn with respect to organization structure by performing statistical analysis of the available data on commits in R. The bug management system - a very important attribute of software quality is probed further while carrying out statistical analysis of the bug data of R. This supports the rigorous protocol of bug management system for OSS in general and R in particular.

Keywords: Commits, Bug management system, Data science, Software quality, Visualisation

1. INTRODUCTION

In recent times effective modeling, statistics, predictive analysis, data visualizations and powerful analytics is being harnessed by data scientists and leaders in making decisions and policies in a multitude of fields ranging from broad societal mapping, online marketing trends to the development of

Gentleman released this software as free open-source software in 1995 [2]. Presently, the "Comprehensive R Archive Network" (CRAN) is the core of an increasingly growing R community [3] and it serves as the central repository for all resource materials related to R, including packages of functions, tutorials and discussion forums. The official public structure for the R Community is under the aegis of the R Foundation - a not for profit organization with a prestigious list of members and supporters. R is registered under GNU (General Public License). R is a programming language used by statisticians, data scientist and anybody who need to perform statistical analysis of data and process useful information from data using various mechanisms, such as classification, regression and text analysis. Currently, R has 782K lines of code which has increased from 82K lines of codes in 1997(about 35% C, 31% FORTRAN and 20% R) [4]. Changes in the code to base R are an exclusive domain of the core team members of R. Till now a total of twenty five members of R-core have contributed to R, Currently R-core has twenty members.

1.1 Characteristics of R

R is a programming language wherein data analysis is carried out by writing functions and scripts. However R is an easy language to learn. R is characterized by an extensive set of library functions which can implement not only mathematical but techniques of other disciplines like graphical, classification,

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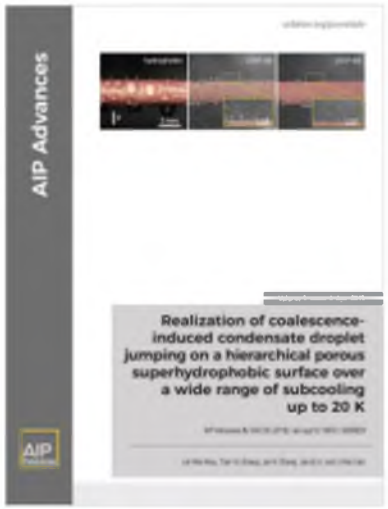
Volume 9, Issue 4
April 2019



RESEARCH ARTICLE | APRIL 03 2019

Dynamics of a vertically vibrating mercury drop

Tanu Singla; Dinesh Kumar Verma; Josué Flores Tovar; A. Figueroa ; Federico Vázquez; Farook Bashir Yousif ; M. Rivera

+ Author & Article Information
AIP Advances 9, 045204 (2019)
https://doi.org/10.1063/1.5088043 Article history

The dynamics of vertically vibrating liquid drops has been studied by several researchers and different phenomena have been reported. In the present work, we report experimental results for some interesting phenomena that can be observed in a liquid drop subjected to vertical vibrations.

ELSEVIER

Journal of Hazardous Materials

Volume 370, 15 May 2019, Pages 126-137

Fabrication and characterization of ZnO-TiO_2-PANI (ZTP) micro/nanoballs for the detection of flammable and toxic gases

Rakesh K. Sonker [a b], B.C. Yadav [b], Vinay Gupta [a], Monika Tomar [c]

https://doi.org/10.1016/j.jhazmat.2018.10.016

Abstract

The present paper reports the in-situ chemical polymerization of nanocomposites thin film composed by titanium dioxide (TiO_2), zinc oxide (ZnO) and polyaniline (PANI). It was found that nanocomposites sensor is highly selective and shows response to low concentration. To improve the sensing response characteristics of ZT thin film, PANI is incorporated. Thin film based LPG sensor of ZnO-TiO_2-PANI composite was fabricated by spin coating of ZnO-TiO_2 nanoparticles doped with PANI over inter digital electrodes (IDEs). The thin film was characterized by using XRD, SEM, TEM, UV–vis, BET and FTIR. It was also tested for gas sensing properties of LPG/NO_2 which are well known flammable and toxic gases. The measured response for ZnO-TiO_2-PANI based sensor was 87 for 2000 ppm of LPG and 412 for 20 ppm of NO_2 at room temperature towards other testing gases together with Acetone, IPA, NH_3 and CO_2.

ELSEVIER

Journal of Molecular Liquids

Volume 290, 15 September 2019, 111241

Investigation of thermodynamical, dielectric and electro-optical parameters of nematic liquid crystal doped with polyaniline and silver nanoparticles

Tripti Vimal [a], Kaushlendra Agrahari [a], Rakesh Kumar Sonker [b], Rajiv Manohar [a]

https://doi.org/10.1016/j.molliq.2019.111241

Abstract

In the present investigation, thermo-dynamical, dielectric & electro-optical characterization of a neamtic liquid crystal (NLC) and its mixtures with polyaniline (PANI) & silver nanoparticles (Ag NPs) have been carried out. To visualize the combined effect of polyaniline and silver nanoparticles, a polyaniline/silver nanocomposite has been prepared. Equal concentration of polyaniline, silver nanoparticles & polyaniline/silver nanocomposite has been taken and doped into the pure NLC material. A comparison of various LC parameters of pure NLC material and its mixtures with different dopant has also been done. Thermodynamical study suggests that the presence of polymer and nanoparticles duo in LC can tune the order parameter of LC material.

Applied Surface Science

Volume 479, 15 June 2019, Pages 326-333

Full length article

Synthesis and characterization of highly porous hexagonal shaped CeO_2-Gd_2O_3-CoO nanocomposite and its opto-electronic humidity sensing

Samiksha Sikarwar [a], B.C. Yadav [a], Rakesh K. Sonker [b], G.I. Dzhardimalieva [c], Jeevitesh K. Rajput [d]

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https://doi.org/10.1016/j.apsusc.2019.02.108

Abstract

The present paper reports the synthesis and fabrication of CeO_2-Gd_2O_3-CoO nanocomposite films using metal carboxylates as precursors. The refractive index of the film was found as 1.445538. The crystallinity was confirmed from XRD and the minimum crystallite size calculated was 9 nm. TEM analysis showed the hexagonal crystals where the minimum dimension was obtained as 6 nm. The dimensionality was further confirmed by Particle Size Analyzer. The film was then examined using SEM which revealed highly porous nature of the material. UV–Vis spectrophotometer found the absorption of the film taking place in UV-region and the optical band-gap as determined

Chaos. 2019 May;29(5):053112. doi: 10.1063/1.5083179.

Entrainment of aperiodic and periodic oscillations in the Mercury Beating Heart system using external periodic forcing

Pawan Kumar [1], P Parmananda [1], Dinesh Kumar Verma [2], Tanu Singla [2], Iram de Nicolás [2], J Escalona [2], M Rivera [2]

Affiliations + expand

PMID: 31154773 DOI: 10.1063/1.5083179

Abstract

We report experimental results indicating entrainment of aperiodic and periodic oscillatory dynamics

EurJOC
European Journal of Organic Chemistry

Chemistry Europe
European Chemical Societies Publishing

Volume 2019, Issue 1
January 10, 2019
Pages 150-155

Full Paper

Recyclable Organocatalyst for One-Pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone Spirooxindoles

Miao Liu, Xiaofeng Zhang, Xin Huang, Gagan Dhawan, Jason Evans, Manpreet Kaur, Jerry P. Jasinski, Wei Zhang

First published: 04 October 2018 | https://doi.org/10.1002/ejoc.201801480 | Citations: 11

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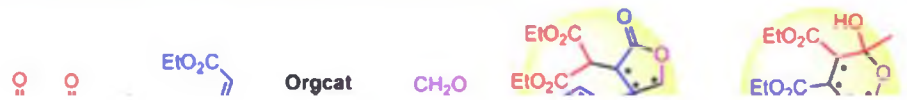
Graphical Abstract

Recyclable fluorous bifunctional organocatalyst-promoted one-pot Michael/aldol/cyclization sequence affords asymmetric dihydrofuranone or tetrahydropyranone spirooxindoles in 39–82 % yields with 3:1 to 6:1 *dr* and up to 99 % *ee* for the major diastereomers



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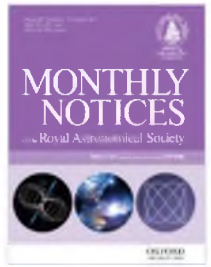

Volume 489, Issue 3
November 2019

Article Contents

JOURNAL ARTICLE

Morphology of the Small Magellanic Cloud using multiwavelength photometry of classical Cepheids

Sukanta Deb ✉, Kerdaris Kurbah, Harinder P Singh, Shashi M Kanbur, Chow-Choong Ngeow, Biman J Medhi, Subhash Kumar

Monthly Notices of the Royal Astronomical Society, Volume 489, Issue 3, November 2019, Pages 3725–3738, https://doi.org/10.1093/mnras/stz2328

Published: 22 August 2019 **Article history** ▾

ABSTRACT

This is the second of a series related to the study of geometry of the Magellanic Clouds based on multiwavelength photometry of classical Cepheids. In this paper we determine the geometrical and viewing angle parameters of the Small Magellanic Cloud (SMC) using the Leavitt law for classical Cepheids with/without a break in the law at a certain period as reported in the literature.

Theoretical and experimental investigation on structural stability, electronic and vibrational properties of polyaniline (PANI)

저널정보

장전수학회

Proceedings of the Jangjeon Mathematical Society | 학술저널

Proceedings of the Jangjeon Mathematical Society Vol.22 No.1

2019.1 | 129 - 139 (11page)

저자정보

Rakesh K. Sonker (University of Delhi)

Rajkamal Shastri (Babasaheb Bhimrao Ambedkar University)

B.C. Yadav (Babasaheb Bhimrao Ambedkar University)

Article | Open Access | Published: 15 October 2020

Structural basis of peroxidase catalytic cycle of human Prdx6

Rimpy Kaur Chowhan, Hamidur Rahaman & Laishram Rajendrakumar Singh

Scientific Reports **10**, Article number: 17416 (2020) | Cite this article

1770 Accesses | **7** Citations | Metrics

Abstract

Peroxiredoxin 6 (Prdx6) is a ubiquitously expressed antioxidant non-selenium glutathione peroxidase that is known to play a major role in various physiological and pathological processes. It belongs to the family of peroxidases (referred to as Peroxiredoxins, Prdx's) that work independently of any prosthetic groups or co-factors, and instead utilize a peroxidatic thiol residue for peroxide reduction. Mammalian Prdx's are classified according to the number of Cys implicated in their catalytic activity by the formation of either inter-molecular (typical 2-Cys, Prdx1–4) or intra-molecular (atypical 2-Cys, Prdx5) disulfide bond, or non-covalent

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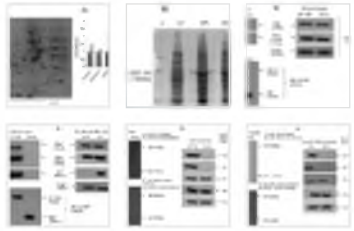

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Virology
Volume 549, October 2020, Pages 59-67

Experimental validation of influenza A virus matrix protein (M1) interaction with host cellular alpha enolase and pyruvate kinase

Shruti Mishra [1], Priya Goyal [1], Deepshikha Kumar, Rajan Chaudhari, Maitreyi S. Rajala

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https://doi.org/10.1016/j.virol.2020.07.019

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Abstract

Influenza A virus, a respiratory pathogen manipulates various host cellular processes to establish a successful infection in a host. We had reported earlier the interaction of influenza A virus nucleoprotein with host glycolytic enzymes; alpha enolase and pyruvate kinase in A549cells. Matrix protein (M1), another multifunctional protein encoded by genome segment 7 forms the inner layer of the virion and interacts with the ribonucleoprotein complex. Nucleoprotein and matrix protein, major structural components of the virion together contribute to the stability of the capsid. Thus, we have investigated the interaction of viral matrix protein with host glycolytic enzymes; alpha enolase and pyruvate kinase. Results had demonstrated differential expression of these two glycolytic enzymes in response to matrix protein and their interaction with matrix protein by *in vitro* binding, co-immunoprecipitation and co-localization studies. Our results confirmed that viral matrix protein interacts with host glycolytic enzymes in association with viral nucleoprotein.

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Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films

Vishal Dhingra[1,3], Shani Kumar[1,3], Ravi Kumar[4], Amit Garg[1] and Arijit Chowdhuri[2]

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Materials Research Express, Volume 7, Number 6

Citation Vishal Dhingra *et al* 2020 *Mater. Res. Express* **7** 065012

DOI 10.1088/2053-1591/ab9ae7

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Abstract

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Materials Research Express

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Room temperature SO_2 and H_2 gas sensing using hydrothermally grown GO–ZnO nanorod composite films

Vishal Dhingra[1,3], Shani Kumar[1,3], Ravi Kumar[4], Amit Garg[1] and Arijit Chowdhuri[2]

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Materials Research Express, Volume 7, Number 6

Citation Vishal Dhingra *et al* 2020 *Mater. Res. Express* **7** 065012

DOI 10.1088/2053-1591/ab9ae7

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Technical Paper | Published: 17 March 2020

Extraction of admittance parameters of symmetrically doped AlGaN/GaN/AlGaN DH-HEMT for microwave frequency applications

Nisha Chugh, Manoj Kumar, Monika Bhattacharya & R. S. Gupta

Microsystem Technologies **27**, 4065–4072 (2021) | Cite this article

Abstract

An analytical model for determining intrinsic short-circuit admittance (Y) parameters of AlGaN/GaN/AlGaN Double Heterostructure (DH) High Electron Mobility Transistor (HEMT) is presented. These Y parameters obtained in terms of the various small signal equivalent circuit parameters are in turn used to evaluate the enhanced microwave performance of the DH-HEMT in terms of various parameters including Unilateral Power Gain and maximum oscillation frequency. The cut-off frequency has been evaluated from short circuit current gain. The cut-off frequency (f_T) and maximum oscillation frequency (f_{max}) exhibited for DH-HEMT is 125 GHz and 215 GHz which is comparatively improved as obtained in Single

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Materials Chemistry and Physics

Volume 239, 1 January 2020, 121975

Synthesis of CdS nanoparticle by sol-gel method as low temperature NO_2 sensor

Rakesh K. Sonker [a b], B.C. Yadav [b], Vinay Gupta [a], Monika Tomar [c]

https://doi.org/10.1016/j.matchemphys.2019.121975

Abstract

In the present work, NO_2 gas sensor based on Cadmium sulfide (CdS) nanostructures were prepared by using the chemical route technique. CdS thin films of different thickness were prepared by spin coating technique with different speed (1000, 2000 and 3000 rpm). Prepared thin films were characterized by techniques, such as X-ray diffraction (XRD), Scanning Electron Microscopy (SEM), Transmission Electron Microscopy (TEM), Fourier Transform Infrared spectroscopy (FT-IR) and Ultraviolet–Visible spectroscopy (UV–Vis), which offered the information about the chemical structure and morphology of CdS thin film. Gas sensing measurements for detecting

Advances in Zoology and Botany

Advances in Zoology and Botany Vol. 8(1), pp. 12 - 19
DOI: 10.13189/azb.2020.080103
Reprint (PDF) (926Kb)

Optimizing Synthesis of Citrus limetta Peel Silver Nanocomposites Possessing Larvicidal Potential against Dengue Vector, Aedes aegypti L.

Devina Aggarwal [1], Aarti Sharma [2], Sarita Kumar [3,*]

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[2] Department of Life Sciences (SOS), Indira Gandhi National Open University, New Delhi, India

[3] Department of Zoology, Acharya Narendra Dev College, University of Delhi, New Delhi, India

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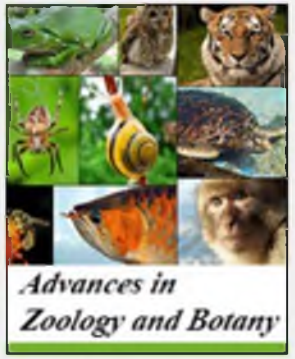
Aedes aegypti L. is the major vector accountable for the spread of several diseases of medical importance. The control strategies primarily relying on chemical insecticides have caused negative impact on our environment and human health. Thus, current study employed Citrus limetta peel extracts (CLPE) against larvae of Ae. aegypti. Silver nanocomposites (AgNCs) from CLPE were synthesised and the process of synthesis was optimized by varying temperature; volume and concentration of silver nitrate



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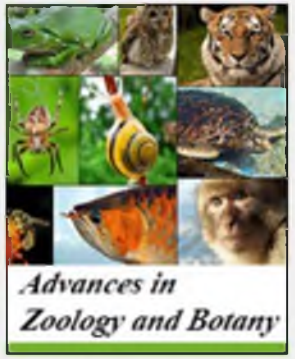

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Asian Pacific Journal of Tropical Biomedicine

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An eco-friendly larvicide against *Aedes aegypti* L.

Sharma, Aarti[1]; Tripathi, Pushplata[1]; Kumar, Sarita[2],

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Asian Pacific Journal of Tropical Biomedicine 10(2):p 54-64, February 2020. | *DOI:* 10.4103/2221-1691.275420

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Original Research Article | Published: 28 May 2020

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Vinay Singh Dagar, Monika Mishra & Sarita Kumar

International Journal of Tropical Insect Science **40**. 1069–1077 (2020) | Cite this article

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Volume 72 Issue 1

Archives of Biological Sciences 2020 Volume 72, Issue 2, Pages: 271-278
https://doi.org/10.2298/ABS200308021M
Full text (181 KB)
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Effects of β-sitosterol on growth, development and midgut enzymes of Helicoverpa armigera Hübner

Mishra Monika *(Department of Zoology, Acharya Narendra Dev College (University of Delhi), Kalkaji, New Delhi, India)*
Sharma Aarti *(Department of Zoology, Acharya Narendra Dev Coellege (University of Delhi), Kalkaji, New Delhi, India)*
Dagar Vinay Singh *(Department of Zoology, Acharya Narendra Dev College (University of Delhi), Kalkaji, New Delhi, India)*
Kumar Sarita *(Department of Zoology, Acharya Narendra Dev College (University of Delhi), Kalkaji, New Delhi, India)*

Helicoverpa armigera is a global agricultural pest of serious concern. Continued use of chemical insecticides as control measures has raised grave health and environment concerns, necessitating a search for botanicals as safe alternatives. The current study investigates the effects of β-sitosterol, a bioactive phytocomponent in Thevetia neriifolia, on the growth and development, as well as on midgut enzymes of H. armigera. Dietary β-sitosterol produced dose-dependent systemic toxicity and growth inhibitory effects in H. armigera; the most significant effects were obtained with 10 µg/mL dietary β-sitosterol. Higher prepupal and pupal mortality in comparison to larval mortality and a comparatively greater reduction in average weight gained by later instars point to cumulative effects of β-sitosterol. The delayed effects were ascertained by the 82.05%-57.89% reduction in adult emergence in comparison to 95.02% emergence in controls. Dose-dependent effects of β-sitosterol were observed as significantly decreased enzyme activities of alanine aminotransaminase (ALT), aspartate aminotransaminase (AST) and alkaline phosphatase (ALP) in the larval midgut. Suppression of enzyme activity was obtained in the order ALT>AST>ALP. Impaired activity of gut enzymes possibly lowered the energy reserves and affected nutrient transport through the gut epithelium, affecting the growth and development of H. armigera. Our study points to a promising use of β-sitosterol against H. armigera, although further examination and field studies are needed to ascertain its possible use in control programs.

Keywords: Helicoverpa armigera, β-sitosterol, alanine aminotransaminase, aspartate aminotransaminase, alkaline phosphatase

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Mini-Review | Published: 25 May 2020

Potential applications of extracellular enzymes from *Streptomyces* spp. in various industries

Munendra Kumar, Prateek Kumar, Payal Das, Renu Solanki & Monisha Khanna Kapur

Archives of Microbiology **202**, 1597–1615 (2020) | Cite this article

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Abstract

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Journal of King Saud University - Science
Volume 32, Issue 4, June 2020, Pages 2316-2328

Original article

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Abstract

Tetmemena saprai n. sp. was isolated from fresh-water samples collected from Okhla Bird Sanctuary, Delhi, India and described based on its morphology, morphogenesis and molecular markers, namely the small-subunit (SSU) rRNA gene and internal transcribed spacers (ITS1-5.8S-ITS2). The morphological features of *T. saprai* n. sp. are as follows:

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Spiro-Indole-Coumarin Hybrids: Synthesis, ADME, DFT, NBO Studies and In Silico Screening through Molecular Docking on DNA G-Quadruplex

Dr. Leena Khanna, Sugandha Singhal, Prof. Dr. Subhash C. Jain, Dr. Pankaj Khanna

First published: 19 March 2020 | https://doi.org/10.1002/slct.201904783 | Citations: 9

Graphical Abstract

Six new hybrids, spiro[indol-indazole-thiazolidine]-dione-coumarin hybrids (10a-c) and spiro[indol-pyrazole-thiazolidine]-dione-coumarin hybrids (12a-c), were synthesized successfully *via* hitherto unknown Schiff bases. These compounds were virtually screened for their drug likeliness, toxicity and docking interactions with DNA G-quadruplex (compared with library of known compounds). The Density Functional Theory (DFT) electronic reactivity descriptors, depicted their high chemical reactivity and the Molecular Electrostatic Potential (MEP) and contour plots described their potential active sites. Further, the detailed Natural bond order (NBO) analysis of these hybrids suggested

Recommended

Virtual Screening, Molecular Docking, and DFT Studies of Some Thiazolidine-2,4-diones as Potential PIM-1 Kinase Inhibitors

Vivek Asati, Santosh S. Thakur, Neeraj Upmanyu, Sanjay K. Bharti

ChemistrySelect

Molecular Structure, Spectral, Electronic and Thermodynamic, First-Order Hyperpolarizability, NBO and Molecular Docking Studies of Novel Acenaphthylene Pyrrolidine Derivative

Original research article | Published: 27 May 2020

Biogenic Silver Nanoparticles: Evaluation of Their Biological and Catalytic Potential

Bhawna Sharma, Indu Singh, Somvir Bajar, Seema Gupta, Hemant Gautam & Pradeep Kumar

Indian Journal of Microbiology **60**, 468–474 (2020) | Cite this article

455 Accesses | **11** Citations | Metrics

Abstract

The biogenic tailoring of silver nanoparticles using plant extract is becoming an attractive approach in the current scenario. *Manilkara zapota* (MZ) is well known for its antibacterial, hepato-protective, anti-inflammatory, anti-tussive, anti-fungal, anti-tumour, and free radical scavenging potential. Its plants extract is a rich source of secondary metabolites. Nowadays, silver nanoparticles (AgNPs) have been advocated for a variety of biomedical applications. In present work, silver nanoparticles have been synthesized using an aqueous extract of MZ, physicochemically characterized and finally evaluated for antimicrobial effects, catalytic reduction/degradation of organic dyes and cytotoxicity. The nanosized AgNPs (~ 84 nm) were found to possess prominent antibacterial potential against gram positive and gram negative

REVIEW article

Front. Bioeng. Biotechnol., 29 May 2020
Sec. Nanobiotechnology
Volume 8 - 2020 | https://doi.org/10.3389/fbioe.2020.00504

This article is part of the Research Topic
Functionalized Nanocarriers for Theranostics
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Ultrashort Peptide Self-Assembly: Front-Runners to Transport Drug and Gene Cargos

Seema Gupta[1*] Indu Singh[1,2] Ashwani K. Sharma[2*] Pradeep Kumar[2*]

[1] Chemistry Department, Acharya Narendra Dev College, University of Delhi, New Delhi, India
[2] Nucleic Acids Research Laboratory, CSIR-Institute of Genomics and Integrative Biology, New Delhi, India

The translational therapies to promote interaction between cell and signal come with stringent eligibility criteria. The chemically defined, hierarchically organized, and simpler yet blessed with robust intermolecular association, the peptides, are privileged to make the cut-off for sensing the cell-signal for biologics delivery and tissue engineering. The signature service and insoluble network formation of the peptide self-assemblies as hydrogels have drawn a spell of research activity among the scientists all around the globe in the past decades. The therapeutic peptide market players are anticipating promising growth opportunities due to the ample technological advancements in this field. The presence of the other organic moieties, enzyme substrates and well-established protecting groups like Fmoc and Boc etc., bring the best of both worlds. Since the large sequences of peptides severely limit the purification and their isolation, this article reviews the account of last 5

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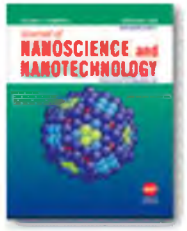

Adsorption of Rhodamine 6G Dye on Binary System of Nanoarchitectonics Composite Magnetic Graphene Oxide Material

Authors: Gautam, Drashya; Lal, Shyam; Hooda, Sunita
Source: Journal of Nanoscience and Nanotechnology, Volume 20, Number 5, May 2020, pp. 2939-2945(7)
Publisher: American Scientific Publishers
DOI: https://doi.org/10.1166/jnn.2020.17442

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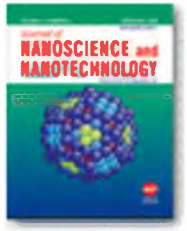
Abstract | References | Citations | Supplementary Data | Suggestions

Magnetic Graphene Oxide nanocomposite prepared by the co-precipitation method based on concept of nanoarchitectonics. In co-precipitation method, Graphene oxide converts into Magnetic graphene oxide nanocomposite with uniform deposition of Fe_3O_4 nano particles on the surface of Graphene oxide. Field Emission Scanning Electron Microscopy spectroscopy technique reveals the size (~2.5 nm) and uniformity of Fe_3O_4 nano particles on Graphene oxide surface. The other properties characterized by Scanning electron microscopy, Raman spectroscopy, X-ray powder diffraction, X-ray photoelectron spectroscopy and vibrating-sample magnetometer. For Adsorption process, time, temperature, dose of adsorbent, initial concentration of dye solution and pH factors are optimize for Rhodamine 6G dye. Kinetic data expressed by Pseudo first order model and Pseudo second order model. Langmuir, Freundlich and Temkin isotherms used to evaluate the adsorption isotherm of Rhodamine 6G onto the surface of Magnetic graphene oxide nanocomposite and thermodynamic parameters tell us about the nature of reaction.

Keywords: Adsorption; Graphene Oxide; Isotherm; Kinetics; Rhodamine 6G; Thermodynamic Parameters
Document Type: Research Article
Affiliations: Department of Chemistry, Acharya Narendra Dev College (University of Delhi), Govindpuri, Kalka ji, NewDelhi 110019, India
Publication date: 1 May, 2020



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Magnetic Graphene Oxide/Chitin Nanocomposites for Efficient Adsorption of Methylene Blue and Crystal Violet from Aqueous Solutions

Drashya Gautam and Sunita Hooda*

Cite this: *J. Chem. Eng. Data* 2020, 65, 8, 4052−4062
Publication Date: August 3, 2020
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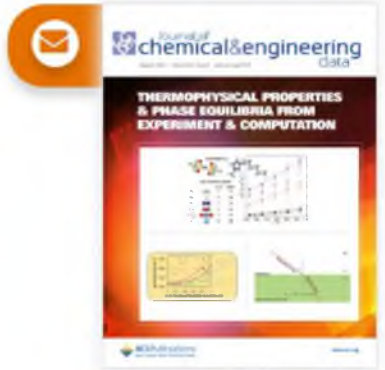
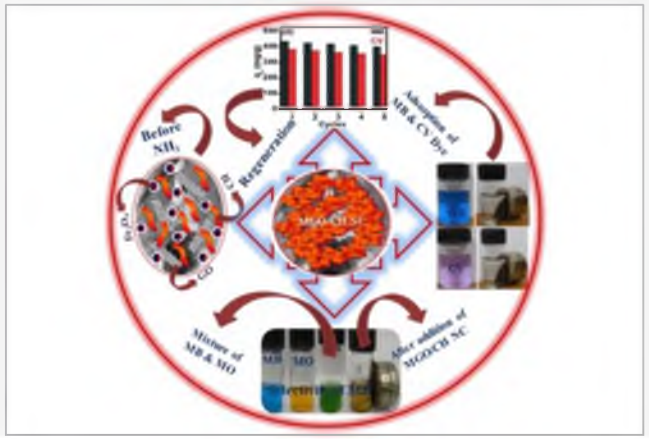


Journal of Chemical & Engineering Data

SUBJECTS: Adsorption, Dyes and pigments, Nanocomposites, Nanoparticles,

Abstract

The present study is focused on the synthesis of prominent magnetic graphene oxide/chitin nanocomposites, which behaves as an adsorbent for organic dyes under visible light. The nanocomposites were characterized using physicochemical techniques such as X-ray diffraction, Fourier transform infrared spectroscopy, Raman spectroscopy, vibrating-sample magnetometer, scanning electron microscopy, and transmission electron microscopy. A band gap energy of 2.01 eV was evaluated from Tauc and Davis–Mott plots. Batch adsorption studies were performed on crystal violet and methylene blue dyes with varying parameters such as time, pH, concentration, dosage, and temperature, which resulted to excellent adsorption activities of 403.78 mg/g for crystal violet and 332.61 mg/g for methylene blue. The as-synthesized nanocomposite showed excellent recovery capability, retaining its adsorption efficiency even after nine cycles of regeneration. The adsorption equilibrium data fitted well into the pseudo-second-order model and Langmuir isotherm model, while the spontaneity and exothermic nature of the adsorption phenomenon are demonstrated by thermodynamic studies. A comparative adsorption study results to a selective adsorption of cationic dyes over anionic ones, which goes in conformity with the high negative value of zeta potential obtained at



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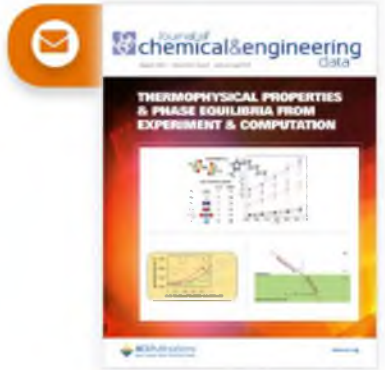

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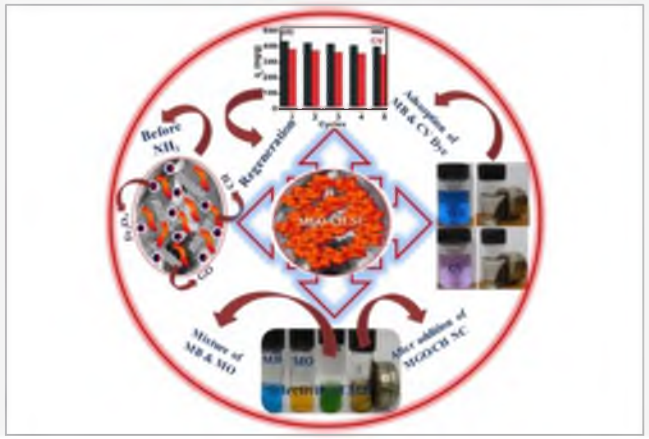

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ISSN: 1932-9466
Vol. 15, Issue 1 (June 2020), pp. 273 – 281

Applications and Applied
Mathematics:
An International Journal
(AAM)

Complexity Dynamics of Gumowski-Mira Map

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Received: January 4, 2020; Accepted: April 27, 2020

Abstract

In the context of nonlinear dynamics, interesting dynamic behavior of Gumowski-Mira Map has been noted under various feasible circumstances. Evolutionary phenomena are discussed through the study of bifurcation analysis leading to period-doubling and chaos. The appearance of chaos in the method is identified by plotting Lyapunov characteristic exponents (LCE) and Topological Entropy within certain parameter range. Dynamic Lyapunov Indicator (DLI) has been procured for further identification of regular and chaotic motions of the Gumowski-Mira Map. The numerical results through the indicator DLI clearly demonstrate the behavior of our map. The correlation dimension has been calculated numerically for the dimension of the chaotic attractor.

Keywords: Bifurcation; Chaos indicators; Topological entropy; Correlation dimension

MSC 2010 No.: 37G15, 37D45

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CHAOS MEASURE IN AUTONOMOUS LPA MODEL

Sada Nand Prasad[1], L. M. Saha[2] and Abdulah A. Ansari[3,*]

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*. Corresponding Author

June 20, 2020

Abstract

The discrete autonomous LPA model of dynamical systems investigated for regular and chaotic evolutions under different feasible conditions in the framework of nonlinear dynamics. Evolutionary phenomena discussed through bifurcation analysis leading to chaos. As part of chaos measure, numerical calculations performed to obtain Lyapunov characteristic exponents (LCE), Topological Entropy, correlation dimension etc. The results obtained by numerical calculations are demonstrated through various graphics. Chaotic evolutions discussed at critical set of parameters, which reveals very significant results. Correlation dimension, which provides dimensionality of an attractor (Strange/Chaotic), obtained numerically by the use of certain statistical method.

Keywords: Autonomous LPA model, Bifurcation, Lyapunov Characteristic Exponents, Topological Entropy, Correlation Dimension.

1 Introduction

Mathematical models expressing real phenomena are mostly nonlinear in nature. Their evolutionary dynamical behavior often shows properties like unpredictability and chaos attracting researchers obtaining interesting results [4; 5; 24]. The model on population dynamics and ecology are frequently used models and most considerable problems in dynamical systems. Investigators generally prefer to use difference equation while describing mathematical models in context of biological models. Numerous articles have appeared on such models after publication of articles by R. May [17; 18] with reasonable assumption of evolution processes of population in concerned. Such studies generate quite interesting results.

Many nonlinear systems exhibit chaos in some parameter space but in some cases within the system because of the interaction among different agents, complexity character also visible during evolution. Unpredictable motion is thus a mix phenomenon of chaos and complexity. Presence of complexity is responsible of coexistence of multiple attractors, bistability, intermittency, cascading effects, exhibit of hysteresis properties, and some more properties, [3; 6; 9; 26]. Chaotic evolution measured by positivity of Lyapunov exponents, (LCEs), whereas its negative value signifies the system is regular, [2; 8; 13]. Complexity measured by increase of topological entropy; more increase in topological entropy signifies the system is more complex. [7; 14; 15; 21; 22; 27].

Evolution in insects considered metamorphosis since big changes observed during their growth and development. Insect evolution passes through four clearly different stages: egg, larvae, pupae and adult. Class of such insects listed as butterflies, moths, beetles, flies, bees, wasps, and ants. Changing from one stage to another an insect has to molt its skin and each time it emerge larger and of different form until it reaches the adult stage. [10]. Some

Supply Chain Model for Expiring Items Following Ramp-Type Demand With Stochastic Lead Time Under Crisp and Fuzzy Environment

Chaman Singh, S.R. Singh

Source Title: International Journal of Fuzzy System Applications (IJFSA) 9(1)
Copyright: © 2020 | Volume: 9 | Issue: 1 | Pages: 28
ISSN: 2156-177X | EISSN: 2156-1761 | EISBN13: 9781522598411 | DOI: 10.4018/IJFSA.2020010103

Abstract

Supply chain models with deteriorating items, season pattern demand, expiration and uncertain lead time, though common in practice; had received little attention from researchers. In this article, the authors proposed a collaborative system with ramp type seasonal pattern demand rate for expiring items with supplier's random lead time under crisp and fuzzy environment considering the effect of inflation and time value of money. For the seasonal kind of items, demand rate follows the combination of increasing-steady-decreasing demand patterns. A supplier's lead time is a stochastic function of his managing cost; thus, the extra costs incurred on the retailer due to the uncertainty in lead time in terms of shortages costs and lost sales costs are owed by the supplier. Numerical examples are cited to illustrate the results and its significant features. Finally, to study the effect of change of parameters sensitivity analysis is presented and necessary observations are made.

1. Introduction

In the existing literature, most of the inventory/supply chain model was developed considering three types of demand rates: (i) constant demand rate; (ii) linearly positive/negative demand rate; and (iii) exponentially increasing/decreasing demand rate. However, demand for a commodity cannot increase/decrease continuously over time. It is observed that demand for seasonal products like fruits and the fashionable products over the entire time horizon is three folded. At the beginning of the season demand increases more rapidly, as the time passes, it becomes steady in the middle of the season and decreases more rapidly towards the end of the season and becomes asymptotic. The term "ramp type" is used to represent such kind of demand pattern. In the existing inventory and supply chain models, after the development of classical economic ordering quantity model by Wilson (1934) under the assumption of constant demand rate, researchers extensively studied several aspects of inventory and supply chain modeling by assuming time-dependent demand rate. The assumption of constant demand rate is usually valid in the mature stage of a product's life cycle. In the growth and/or end-stage life cycle, demand rate may well be approximated by a time-dependent function. Resh et al. (1976) were the first who developed a model with linearly time-varying demand. Hill (1995) first resolved the indiscipline of time-dependent demand pattern by considering the demand

Outline

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International Journal of Biological Macromolecules

Volume 149, 15 April 2020, Pages 1139-1150

The anti-oxidant enzyme, Prdx6 might have *cis-acting* regulatory sequence(s)

Sharifun Shahnaj [a], Angamba Meetei Potshangbam [a], Rimpy Kaur Chowhan [b], Zahoor Ahmad Parray [c], Pushpa Kakchingtabam [a], Anju Kumari [b], Asimul Islam [c], Aslam Khan [d], Laishram Rajendrakumar Singh [b], Hamidur Rahaman [a]

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https://doi.org/10.1016/j.ijbiomac.2020.01.311

Abstract

Peroxiredoxin 6 (Prdx6) is a ubiquitously expressed 1-cysteine Peroxiredoxin found throughout all phyla. In mammals, under different physiological conditions, it has evolved from a peroxidase to a multifunctional enzyme. Among the mammalian Prdx6's, human and rat Prdx6's are the most extensively studied. Our study revealed that human and rat Prdx6's exhibit differences in their peroxidase activity. These two Prdx6's have only 8% difference in their primary sequence (with 19 amino acids) with no apparent

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Screening of Antitubercular Compound Library Identifies Inhibitors of Mur Enzymes in *Mycobacterium tuberculosis*

Kandasamy Eniyan * • Jyoti Rani * • Srinivasan Ramachandran • Rahul Bhat • Inshad Ali Khan • Urmi Bajpai • Show footnotes

Open Access • DOI: https://doi.org/10.1177/2472555219881148

Abstract

The rapid rise in the emergence of multidrug-resistant (MDR) and extensively drug-resistant (XDR) strains of *Mycobacterium tuberculosis* (Mtb) mandates the discovery of novel tuberculosis (TB) drugs. Mur enzymes, which are identified as essential proteins in Mtb and catalyze the cytoplasmic steps in the peptidoglycan biosynthetic pathway, are considered potential drug targets. However, none of the clinical drugs have yet been developed against these enzymes. Hence, the aim of this study was to identify novel inhibitors of Mur enzymes in *Mycobacterium tuberculosis*. We screened an antitubercular compound library of 684 compounds, using MurB and MurE enzymes of the Mtb Mur pathway as drug targets. For experimental validation, the top hits obtained on in silico screening were screened in vitro, using Mtb Mur enzyme-specific assays. In all, seven compounds were found to show greater than 50% inhibition, with the highest inhibition observed at 77%, and the IC_{50} for these compounds was found to be in the range of 28–50 µM. Compound 5175112 showed the lowest IC_{50} (28.69 ± 1.17 µM), and on the basis of (1) the binding affinity, (2) the stability of interaction noted on

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Outline

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Virus Research

Volume 279, 2 April 2020, 197884

Characterization and genome analysis of B1 sub-cluster mycobacteriophage PDRPxv

Avni Sinha [a 1], Kandasamy Eniyan [a b 1], Prasanth Manohar [b], Nachimuthu Ramesh [b], Urmi Bajpai [a]

https://doi.org/10.1016/j.virusres.2020.197884

Highlights

- A mycobacteriophage PDRPxv was isolated from soil sample using *Mycobacterium smegmatis* as host.
- Mycobacteriophage PDRPxv belongs to the *Siphoviridae* family.
- The complete genome sequence of mycobacteriophage PDRPxv was determined.

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Original Paper | Published: 28 May 2020

Functional characterization of the endolysins derived from mycobacteriophage PDRPxv

Kandasamy Eniyan, Avni Sinha, Shazeb Ahmad & Urmi Bajpai

World Journal of Microbiology and Biotechnology **36**, Article number: 83 (2020) | Cite this article

Abstract

Bacteriophage-derived endolysin enzymes play a critical role in disintegration of the host bacterial cell wall and hence have gained considerable attention as possible therapeutics for the treatment of drug-resistant infections. Endolysins can target both dividing and non-dividing cells and given the vital role peptidoglycan plays in bacterial survival, bacteria are less likely to modify it even if continuously exposed to lysins. Hence, probability of bacteria developing resistance to lysins appear bleak. Endolysins from mycobacteriophages offer great potential as alternative therapeutics for the drug-resistant TB. However, considering that a large number of mycobacteriophages have been discovered so far, the information on endolysins come from only a few mycobacteriophages. In this study, we report the structural

Original Paper | Published: 28 May 2020

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World Journal of Microbiology and Biotechnology **36**, Article number: 83 (2020) | Cite this article

Abstract

Bacteriophage-derived endolysin enzymes play a critical role in disintegration of the host bacterial cell wall and hence have gained considerable attention as possible therapeutics for the treatment of drug-resistant infections. Endolysins can target both dividing and non-dividing cells and given the vital role peptidoglycan plays in bacterial survival, bacteria are less likely to modify it even if continuously exposed to lysins. Hence, probability of bacteria developing resistance to lysins appear bleak. Endolysins from mycobacteriophages offer great potential as alternative therapeutics for the drug-resistant TB. However, considering that a large number of mycobacteriophages have been discovered so far, the information on endolysins come from only a few mycobacteriophages. In this study, we report the structural

Original Paper | Published: 28 May 2020

Functional characterization of the endolysins derived from mycobacteriophage PDRPxv

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Estimating Parameter of the Selected Uniform Population Under the Generalized Stein Loss Function

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Abstract

This paper deals with the problem of estimating scale parameter of the selected uniform population when sample sizes are unequal. The loss has been measured by the generalized Stein loss (GSL) function. The uniformly minimum risk unbiased (UMRU) estimator is derived, and the natural estimators are also constructed under the GSL function. One of the natural estimators is proved to be the generalized Bayes estimator with respect to a noninformative prior. For $k = 2$, we obtained a sufficient condition for an inadmissibility result and demonstrate that the natural estimator and UMRU estimator are inadmissible. A simulation investigation is also carried out for the performance of the risk functions of various competing estimators. Finally, this article represents a conclusion of our study.

Keywords: Generalized Stein loss (GSL) function; Uniform distributions; Inadmissibility; UMRU estimator; Natural estimators; Selection rule; Entropy loss function

MSC 2010 No.: 62E10, 62M90, 60G70, 60E05, 62E10, 62E15

Reliable Path Finding Technique for Mobile Robot

RAMA KANTA CHOUDHURY[1]
CHANDRA KANTA SAMAL[2]

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Abstract - Path planning techniques of mobile robot (Automated Vehicle) is discussed in this paper. Though different researchers had proposed different path planning strategies, each plan has its own advantages and disadvantages. The goal of the research work is to develop an algorithm to find out an optimal path from source to destination along with the obstacles. The path planning algorithm not only minimizes the risk of collision but also reduces the planning time and creates a reliable path to reach the desired destination avoiding obstacles. The proposed algorithm is implemented to get the reliable path and compared with that of the existing algorithm to find the optimized path. The new approach is able to minimize the risk of collisions and travelling time with the help of different parameters and simulation software. It is proved through experimental results that the performance of the proposed algorithm is improves considerably and works efficiently when the shape and size of the image changes. It also turns closely at the corners of the obstacles and also reduces the number of steps without affecting the steps and corners. Time and space complexity analysis for this algorithm is experimentally tested and implemented.

Keywords: NFT, Path planning, Time Complexity, Space Complexity, DDA Optimization, Adj*.

(Received October 28th, 2020 / Accepted November 15th, 2020)

1. INTRODUCTION

Path planning of a mobile robot is to determine a collision-free path from a starting point to a goal point optimizing a performance criterion such as distance, time or energy (distance being the most commonly adopted criterion). Based on the availability of information about environment, there are two categories of path planning algorithms, namely off-line and on-line. Path planning of robots in environments where complete information about static obstacles and trajectory of moving obstacles are known in evolutionary approaches of path planning of mobile robots are discussed. Review shows that optimization algorithms are computationally more efficient and hence are increasingly used in tandem with classic approaches [5].

The path planning algorithm contains various methods with different optimization techniques for optimization. The path planning algorithm developed for various platforms depends on the condition whether it is static or dynamic. Mobile robots are expected to work in many places such as factories, offices and so on. Nowadays, autonomous mobile robots are used in the

Presentation + Paper

20 August 2020

Android-based application for shading analysis and assessment of actual solar energy potential

Amit Garg, Prince Sharma, Vivek Verma, Tarunpreet Kaur

Author Affiliations +

Proceedings Volume 11496, New Concepts in Solar and Thermal Radiation Conversion III; 114960G (2020)
https://doi.org/10.1117/12.2570966
Event: SPIE Optical Engineering + Applications, 2020, Online Only

Abstract

The excessive utilisation of conventional energy sources has highlighted a complicated energy crisis due to high dependency and depletion of non-renewable resources; along with the inefficiency to cope up with the pressing requirements of the economy. Shifting to alternative, replenishable forms of energy and developing technology for the same, will fulfil the current energy needs and complement the national security. Solar energy can be productively exercised to meet the current energy requirements. Shading analysis is one of the most critical steps essential to any successful installation of a solar energy system. In photovoltaics, it is important to analyze shading caused by surrounding objects and/or vegetation. In special cases like analysis

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21 August 2020

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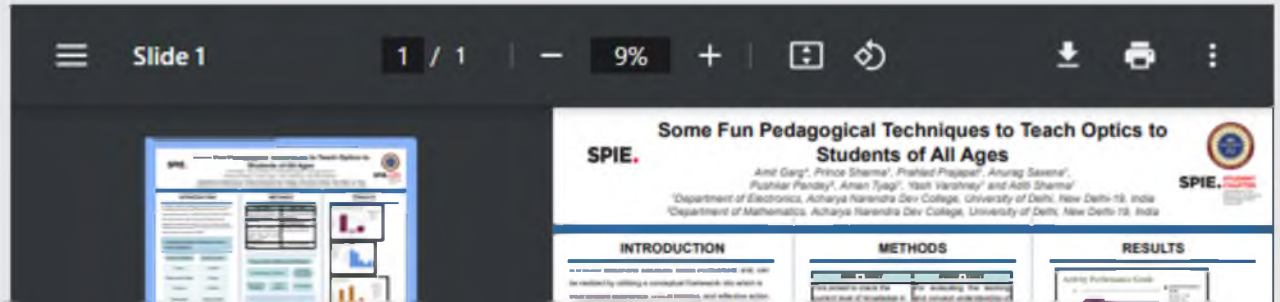

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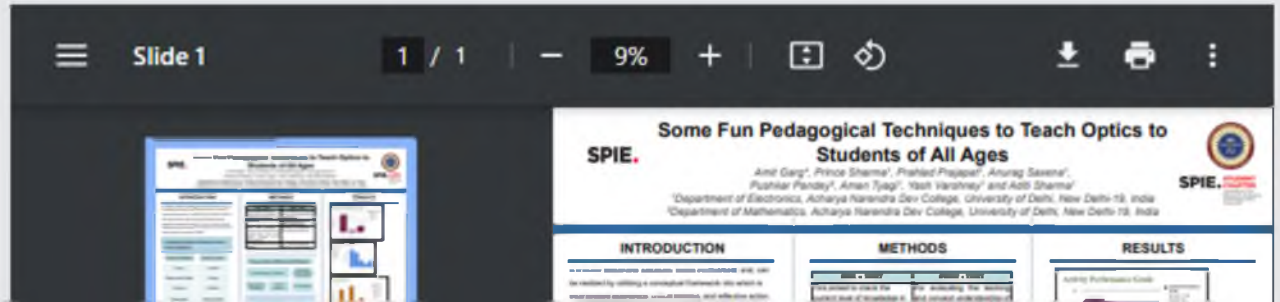

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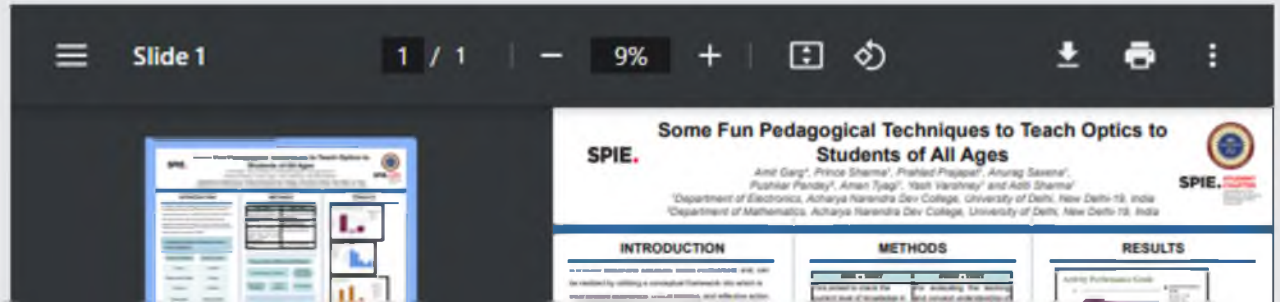

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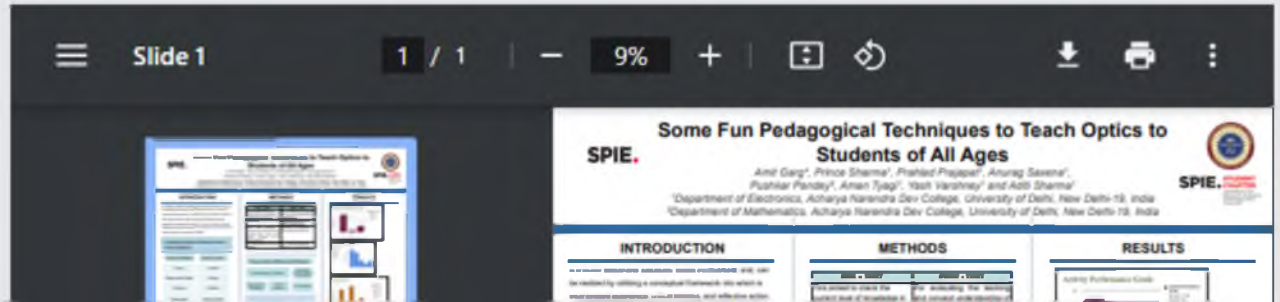

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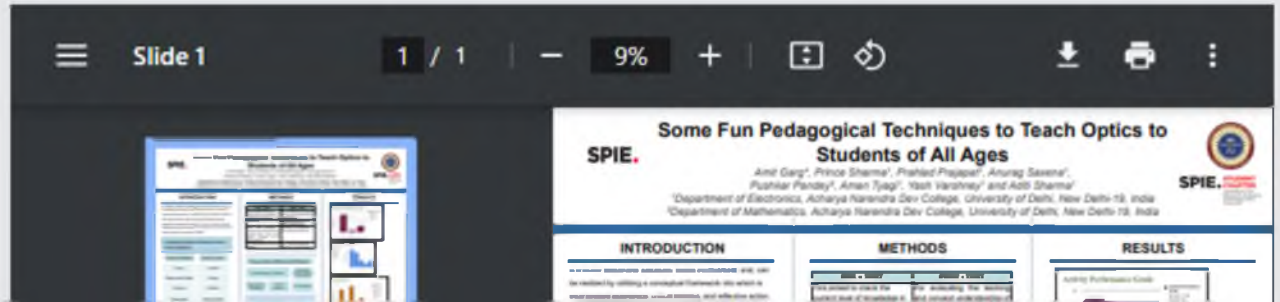

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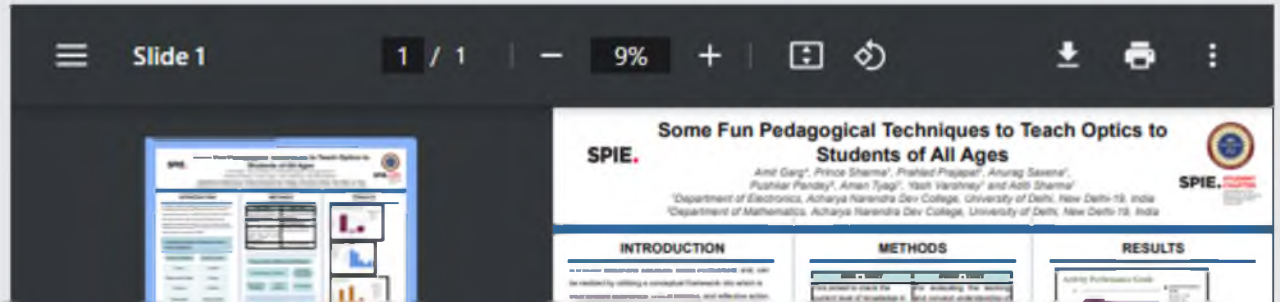

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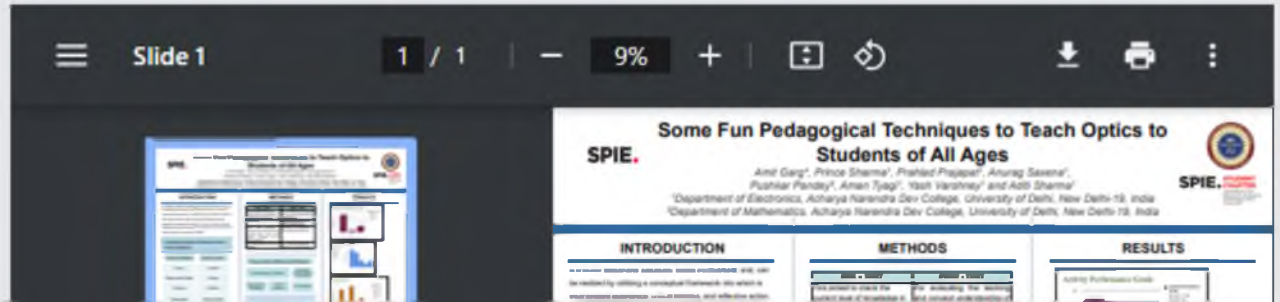

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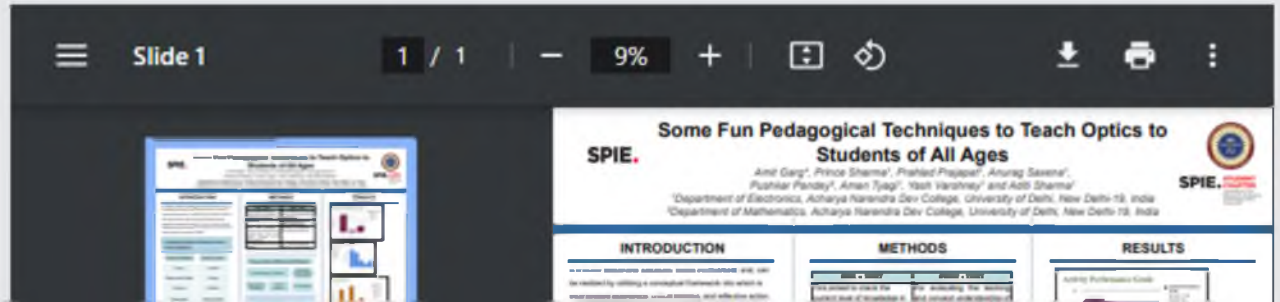

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Defence Science Journal, Vol. 70, No. 5, September 2020, pp. 520-528, DOI : 10.14429/dsj.70.14584

Trace Detection of Nerve Agent Simulant in the Fuel Vapour Environment using Metal Oxide/Surface Acoustic Wave E-Nose

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ABSTRACT

Nerve agents are often used at the military warfront, where diesel is a very common interferant. In the present work, a group of surface acoustic wave (SAW) sensors, called E-Nose with dissimilar sensing layers is developed for the recognition of the mixture of diesel and dimethyl methylphosphonate (DMMP) vapors. The exposure of DMMP and diesel vapors is kept at ppb and ppm levels respectively. Varied response patterns of DMMP and diesel vapors were obtained by SAW E-nose. Principal component analysis (PCA) has been used to extract features from the response curves of SAW sensors. Artificial Neural Network pattern recognition has been implemented to identify the precise detection of DMMP vapors in the binary mixture of DMMP and diesel. The effect of pre-processing (using PCA) the raw data before feeding it to artificial neural network is also studied.

Keywords: E-nose; Metal oxide; Sensor

1. INTRODUCTION

Today chemical attack is one of the biggest threats for us. Nerve agents (Sarin, Soman) are the deadliest and widely used class of chemical warfare agents, employed several times during a war[1]. Sensors employed for their detection must take care of the interferants also. Since the accuracy level required in the detection of warfare agents is very high, special technologies are required to minimize the possibility of false alarms. Nerve agents are mostly used at warfronts, where diesel is the major source of interferant. Diesel is used in tanks, trucks, generators, starting compressors for jet engines[2]. Therefore, sensor systems should be capable of detecting nerve agents in the presence of such interferants.

Presently, there exist various sensing techniques like IR deposition, lack of long-term stability, metal oxide sensing layers have also been tried[9-10].

The use of a single sensor is generally not sufficient to detect a particular vapour in a mixture. Hence an E-nose (an array of sensors) is essentially required. The sensing data of E-nose along with suitable pattern recognition technique (PCA, ANN etc.) allows correct recognition of target vapours[11]. In literature, SAW E-nose has been employed for the recognition of various target vapours[12-15]. Joo[13], *et al.* fabricated an array of polymer- coated SAW sensors for the recognition of simulant vapours but individual vapours were tested and the neural network algorithm was not implemented for precise prediction. Matatagui[9], *et al.* implemented Principal Component Analysis and neural network on the SAW response of few simulants,

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Materials Science and Engineering: B

Volume 258, August 2020, 114577

Green synthesis of TiO_2 nanosheet by chemical method for the removal of Rhodamin B from industrial waste

Rakesh K. Sonker [a b], Gaurav Hitkari [c], S.R. Sabhajeet [d], S. Sikarwar [d], Rahul [e], Sandhya Singh [c]

https://doi.org/10.1016/j.mseb.2020.114577

Abstract

In this research article, the photocatalytic decolourization of rhodamin B by the newly green synthesized TiO_2 nanostructure material has been investigated to consider as effective catalyst for the decontamination of wastewater. The crystal structure and particle size measurement of green synthesized TiO_2 was appraised by X-ray diffraction (XRD). The morphological, structure and particle size distribution was study by SEM and

An overview of factors affecting dengue transmission in Asian region and its predictive models

Roopa Rani Samal
Insect Pest and Vector Laboratory, Department of Zoology, Acharya Narendra Dev College, University of Delhi, India.
Saiesha Gupta
The Benenden School (TBS), Kent, United Kingdom.
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PDF

Published Sep 15, 2020

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Abstract

Among various mosquito-borne diseases, dengue is one of the most prevalent and quickly spreading diseases primarily transmitted by *Aedes aegypti* and *Aedes albopictus*. This review discusses the dengue epidemics in Asian countries with a focus on India and recognizes various climatic, socio-economic, and demographic factors and their complex interaction, involved in dengue expansion. The impact of climatic factors, such as temperature, moisture, and precipitation has been elucidated on the mosquito breeding and disease outbreaks; demonstrating a linear correlation of ambient temperature and humidity with dengue transmission, in contrast with the uncertain association of rainfall. Multifarious empirical models have been developed for estimating the climatic effects on dengue and are used as a baseline to assess the impact on future infections. However, the spatiotemporal distribution of dengue cases can only be predicted best using dynamic modelling

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COMPARATIVE LARVICIDAL EFFICACY OF α-CYPERMETHRIN ALONE AND α-CYPERMETHRIN/*CITRUS SINENSIS* PEEL EXTRACT BINARY MIXTURES AGAINST *AEDES AEGYPTI* L.

DEVINA AGGARWAL, ROOPA RANI SAMAL, SARITA KUMAR*

Aedes aegypti is a widely spread disease vector of great concern throughout the world. With continuous rise in cases of Zika, dengue and Chikungunya worldwide, control of *Ae. aegypti* has become a prime concern. The present study investigated the larvicidal effects of individual and various combinations of *Citrus sinensis* hexane peel extract and a synthetic pyrethroid, alpha-cypermethrin against *Ae. aegypti*. Larvicidal bioassays were performed using WHO protocol with minor modifications. The investigated compounds were found effective individually as well in binary mixtures indicating the efficient synergism. Hexane extract of *Citrus sinensis* peels assayed against *Aedes aegypti* larvae resulted in LC_{50} of 46.53 ppm after exposure for 24 h, while alpha-cypermethrin treatment resulted in LC_{50} value of 0.0063 ppm. The binary mixtures of both the compounds in 1:1, 1:5 and 1:10 ratios also showed significant larvicidal potential. The 1:1 mixture was found most effective with co-toxicity coefficient and synergistic factor as 23.456 and 3.865, respectively, for the LC_{50} at 24h. The binary mixtures showed synergism as well as additive effects in all the ratios tested except 1:5 ratio for LC_{90} at 48h which showed inconsequential antagonistic effect. Results showed decreased synergistic effects with increase in the citrus extract proportion in the binary mixtures. We suggest that phytoextract/cypermethrin mixtures can be more operative than insecticide/phytoextract alone, and can be used as a good ecofriendly approach in vector control programs. Such mixtures could reduce the costs, reduce insecticide dose, and regulate insecticide resistance as part of integrated vector management.

Keywords: *Citrus sinensis*, *Aedes aegypti*, synergism, additive, antagonism, binary mixtures.

INTRODUCTION

Mosquito-borne diseases are the major cause of concern worldwide, especially in tropical countries. Different mosquito vectors, *Aedes*, *Culex* and *Anopheles* transmit a range of disease pathogens causing dengue, Chikungunya, malaria, filariasis and Zika, etc. Though, different species of mosquitoes are playing havoc at global level, yet since last decade, outbreak of *Aedes*-borne diseases has taken a

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Acta Ecologica Sinica

Volume 42, Issue 3, June 2022, Pages 156-161

Reduced physiological and reproductive fitness induced by *Nerium oleander* leaf extracts in the cotton bollworm, *Helicoverpa armigera* (Lepidoptera: Noctuidae)

Aadhya Sivakumar [a], Monika Mishra [b], Vinay Singh Dagar [b], Sarita Kumar [b]

https://doi.org/10.1016/j.chnaes.2020.12.002

Abstract

Helicoverpa armigera is one of the most devastating, cosmopolitan, polyphagous and multivoltine pests of agricultural crops. The growing side-effects of synthetic insecticides used to control agricultural pests, have amplified demand for the relatively safe and biodegradable compounds which offer benefits over synthetic chemical insecticides. Hence, the current study investigates the effects of Nerium oleander methanol leaf

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Original Paper | Published: 21 October 2020

Protection of surplus food from fungal spoilage using *Streptomyces* spp.: a green approach

Munendra Kumar, Prateek Kumar, Payal Das, Renu Solanki & Monisha Khanna Kapur

Archives of Microbiology **203**, 941–950 (2021) | Cite this article

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Abstract

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Original Article | Published: 04 September 2020

Draft genome and secondary metabolite biosynthetic gene clusters of *Streptomyces* sp. strain 196

Prateek Kumar, Anjali Chauhan, Munendra Kumar, Bijoy K. Kuanr, Renu Solanki & Monisha Khanna Kapur

Molecular Biology Reports **47**, 6741–6747 (2020) | Cite this article

743 Accesses | **1** Citations | **3** Altmetric | Metrics

Abstract

Emergence of MDR 'superbugs' inflamed a severe sense of urgency amongst scientists aiming at the discovery of novel potential drug molecules. Bacteria of the genus *Streptomyces* are really worth investigating for their immense potential to produce natural compounds of pharmaceutical importance. In the present study, the genome of *Streptomyces* sp. strain 196 was sequenced, studied and secondary metabolite biosynthetic gene clusters (smBGCs) were detected. FAME analysis was used for taxonomic validation of strain 196. Genome of strain 196 was sequenced using the Illumina NextSeq system which has resulted in a draft genome of 7.4 Mb. Rapid annotation using subsystem technology (RAST) results revealed the presence of

Published: 28 August 2020

Indicators for assessment of soil quality: a mini-review

Swati Maurya, Jeeva Susan Abraham, Sripoorna Somasundaram, Ravi Toteja, Renu Gupta & Seema Makhija

Environmental Monitoring and Assessment **192**, Article number: 604 (2020) | Cite this article

Abstract

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Journal of Molecular Structure

Volume 1199, 5 January 2020, 127003

Ibuprofen-based chemosensor for efficient binding and sensing of Cu^{2+} ion in aqueous medium

Shyam Lal [a], Kunal Prakash [b], Sunita Hooda [a], Vikrant Kumar [a], Pramod Kumar [c]

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https://doi.org/10.1016/j.molstruc.2019.127003

Abstract

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Cite this: *ACS Omega* 2020, 5, 37, 23967−23974
Publication Date: September 14, 2020
https://doi.org/10.1021/acsomega.0c03250

ACS Omega

PDF (3 MB) SI Supporting Info (1) »

SUBJECTS: Catalysts, Catalytic reactions, Ethanol, Inorganic compounds, Reaction products

Abstract

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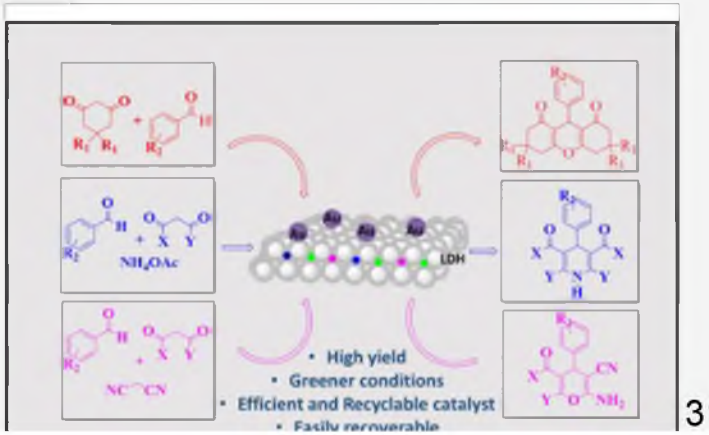

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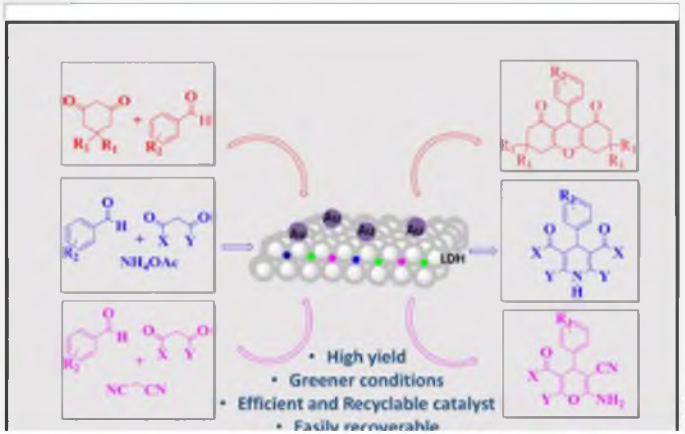

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Laishram Saya, Drashya Gautam, Vipin Malik, W. Rameshwor Singh, and Sunita Hooda*

Cite this: *J. Chem. Eng. Data* 2021, 66, 1, 11−37
Publication Date: November 9, 2020
https://doi.org/10.1021/acs.jced.0c00743

Journal of Chemical & Engineering Data

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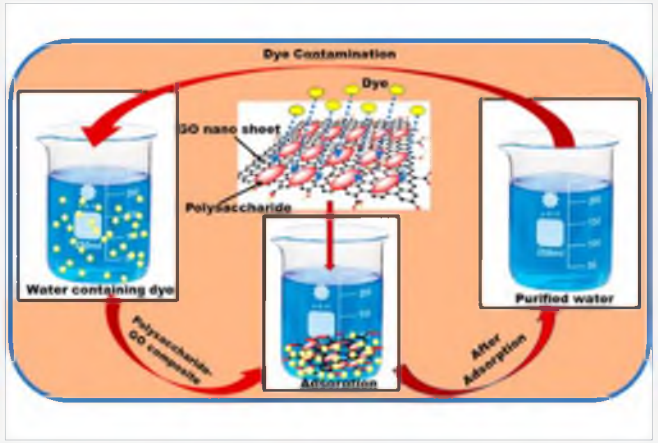

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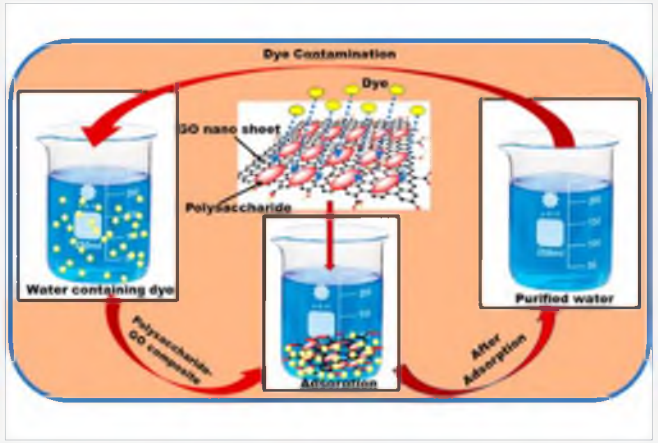

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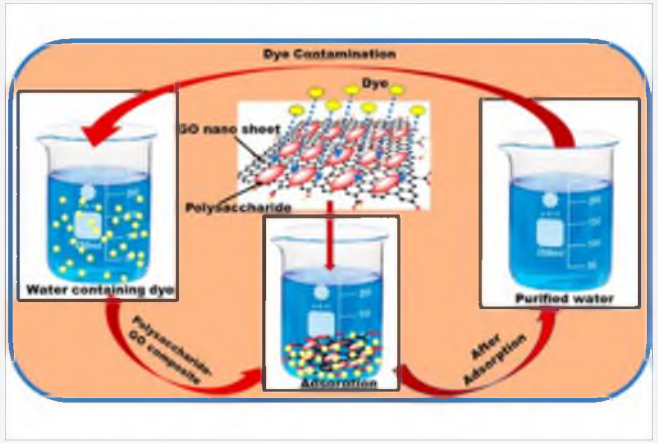

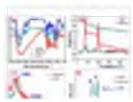

Journal of King Saud University - Science

Volume 32, Issue 8, December 2020, Pages 3351-3358

Original article

Self-nitrogen doped carbons aerogel derived from waste cigarette butts (cellulose acetate) for the adsorption of BPA: Kinetics and adsorption mechanisms

Norah S. Alhokbany [a], Mu Naushad [a b], Vikrant Kumar [c], Saad Al hatim [a], Saad M. Alshehri [a], Tansir Ahamad [a]

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Abstract

The fabrication of highly porous functionalized carbon materials is the demand of current scenario for the removal of toxic pollutants form aqueous solution. Therefore,

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Molecules **2020**, *25*(21), 4953; **https://doi.org/10.3390/molecules25214953**

Received: 14 September 2020 / Revised: 17 October 2020 / Accepted: 19 October 2020 / Published: 26 October 2020

(This article belongs to the Special Issue **Nucleosides – Nucleotides – Oligonucleotides**)

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Abstract

The synthesis of hitherto unknown 5′-deoxy-5′-(4-substituted-1,2,3-triazol-1-yl)-uridine and its evaluation, through an one-pot screening assay, against MurA-F enzymes involved in *Mycobacterium tuberculosis* (Mtb), are described. Starting from UDP-*N*-acetylmuramic acid (UDP-MurNAc), the natural substrate involved in the peptidoglycan biosynthesis, our strategy was to substitute the diphosphate group of UDP-MurNAc by a 1,2,3-triazolo spacer under copper-catalyzed azide-alkyne cycloaddition conditions. The structure-activity relationship was discussed and among the 23 novel compounds developed, *N*-acetylglucosamine analogues **11c** and **11e** emerged as the best inhibitors against the Mtb MurA-F enzymes reconstruction pathway with an inhibitory effect of 56% and 50%, respectively, at 100 µM. Both compounds are selective inhibitors of Mtb MurE, the molecular docking and molecular dynamic simulation suggesting that **11c** and **11e** are occupying the active site of Mtb MurE ligase.

Keywords: Mur ligase; nucleoside analogues; copper-catalyzed azide-alkyne cycloaddition; antibacterial

NEEM FLOWERS (*AZADIRACHTA INDICA*) AS AN ABUNDANT SOURCE OF NECTAR FOR BUTTERFLIES IN AN URBAN LANDSCAPE IN DELHI, INDIA

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Reviewer: Peter Smetacek

Abstract

Most butterflies feed on floral nectar. The ability of butterflies to access nectar deep within a flower depends on the length of their proboscis. Adequate nutrition is known to maintain the reproductive potential of butterflies. In an urban context, lacking adequate parks and gardens, there is always a need of flowers that can provide nectar to butterflies. In this situation, avenue trees, bearing flowers with nectar accessible to a wide range of butterflies, could help maintain a reasonably diverse butterfly population. The Neem tree, *Azadirachta indica*, is planted along roads and in parks in urban areas of Delhi. Its small flowers were found to attract several species of butterflies belonging to all five major families present in Delhi. It is suggested that trees such as *Azadirachta indica* and other nectar trees, if planted as avenue trees, may help in the conservation of butterflies in an urban landscape.

Key words: Flowering tree, Food plant, Butterfly, Urban Landscape

Introduction

Butterflies are liquid-feeding insects; they acquire food by sucking through their long tubular proboscis (Krenn, 2010). Adult butterflies can be broadly categorised into two feeding guilds: nectar feeding (feeding on floral nectar) and non-nectar feeding (acquiring nutrition from decaying fruit, sap, honey dew, etc.). The feeding habits are associated with certain modifications in the microstructure of the proboscis, particularly at the tip (Krenn *et al*., 2001, Molleman *et al*., 2005; Krenn, 2010; Lehnert, *et al*., 2016). A vast majority of butterflies feed on floral nectar (Krenn, 2010). The profitability of feeding on floral nectar depends in part on the depth of the corolla-tube (or the depth at which nectar is seated in flowers); the amount of nectar, proboscis length and wing load (Corbet, 2000; Tiple *et al*., 2009). The shorter proboscis of small butterflies limits them from using flowers with deep seated nectar (May, 1992). Butterflies with a longer proboscis however, can harvest nectar from a broad range of flowers, including flowers with short as well as those with long corolla tubes (May, 1992; Corbet, 2000; Kunte, 2007; Sultana *et al*., 2017). Nutrition is known to maintain high fecundity in female butterflies and increase their body weight and fat storage (Hill *et al*., 1989; O'Brien *et al*., 2004; Mevi-Schutz *et al*., 2005; Geister *et al*., 2008; Karlsson *et al*., 2009). Butterflies obtain nectar from a range of flowers. The role of tree flowers as a source of nectar has not been appreciated by many researchers. Tree flowers however, can be an important source of nectar for butterflies living in or close to forested as well as urban landscapes. Here, I present an account of butterfly species which can benefit from feeding on the flowers of *Azadirachta indica* (A. Juss; Family: Meliaceae) commonly known as 'Neem tree'. The tree commonly grows in urban and rural areas in most parts of India and a few researchers have indicated

A COMPREHENSIVE CHECKLIST OF BUTTERFLIES SEEN IN CORBETT TIGER RESERVE, UTTARAKHAND, INDIA

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Reviewer: Peter Smetacek

Abstract

Corbett Tiger Reserve (CTR) conserves a wealth of flora and fauna and is a known destination for ecotourism in Northern India. Besides mammals and birds, for which CTR is known to many, frequent visits to CTR and its vicinity for watching butterflies are also on the rise in recent times. In this respect, an account of species of butterflies in the CTR and its vicinity would be useful not only for butterfly ecotourism but also for conservational, educational and scientific purposes. By virtue of photographic documentation of species of butterflies in CTR for over a decade, we provide here a list of butterflies seen in various tourist zones of CTR and its immediate vicinity. We recorded 94 genera and 130 species belonging to six families. On the basis of our records and work by others in CTR, a comprehensive checklist of 143 species of butterflies has been compiled.

Introduction

Corbett Tiger Reserve (CTR) is one of the key biodiversity areas in the foothills of Himalaya in Northern India. Established as a wildlife sanctuary with a total area of few hundred square kilometres in 1934, it was upgraded to a National Park in 1936 (Khanna *et al*., 2008). Presently, the CTR has a well-protected expanse of 1288.31 km² (NTCA, 2009). The spread of CTR encompasses a variety of habitats that support diverse flora and fauna (Pant, 1986, Editor-Director, 2008, Khan *et al*., 2008). Besides conserving wilderness, the location and approachability of CTR; and plentiful wildlife attracts lakhs of tourists every year (Badola *et al*., 2010; Gusain, 2015). The recreational value of CTR generates livelihood for the local community (Badola *et al*. 2010; Kumar *et al*., 2019).

Today, butterfly watching is one of the favourite recreational activities for many, and the trend is gradually on the rise. This makes butterflies important from the perspective of ecotourism; defined here as "low impact nature tourism which contributes to the maintenance of species and habitats either directly through a contribution to conservation and/or indirectly by providing revenue to the local community sufficient for local people to value, and therefore protect, their wildlife heritage area as a source of income" (Fennel, 2015; Kumianto *et al*., 2016; Singh *et al*., 2016). The diverse and pristine habitat of CTR is expected to be rich in the diversity of butterflies. However, literature on butterfly diversity in and around CTR is sparse. Only two reports provide an account of species of butterflies found in CTR (Kumar, 2008; Arya *et al*., 2020). The number of species of butterflies mentioned in these reports are 36 (Kumar, 2008), and 56 (Arya *et al*., 2020). The present communication reports 130 species of butterflies based on the observations made

OVIPOSITION BY *JAMIDES BOCHUS* (STOLL, [1782]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN NEW DELHI, INDIA

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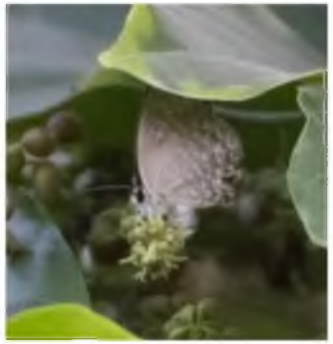
Reviewer: Peter Smetacek

Several individuals of the Dark Cerulean (*Jamides bochus*) were sighted 3-4 times daily between 30. viii.2020 to 20.ix.2020, fluttering over the crown of *Millettia pinnata* (L.) Panigrahi (Fabaceae). On two occasions, more than two individuals were sighted at a time. On 22.ix.2020, a female *J. bochus* was observed laying eggs on nascent buds and leaves of *M. pinnata*, in the Rohini area of New Delhi. It was observed for 5 minutes from a distance of 2.5-3 m and the events were photographed (Figures 1). The butterfly returned twice to the same spot to lay eggs after fluttering for about 1 minute in the vicinity of the twig, where it had laid the first batch of eggs.

M. pinnata is a medium sized tree planted commonly alongside many roads in Delhi. Sightings of *Jamides bochus* in Delhi are rare. However, during the past few years it has been sighted several times. It was so far not known to breed in Delhi (Chaudhary *et. al.*, 2019, Dr. Surya Prakash, *pers. comm.*). The present observation provides supporting evidence towards the assertion by Chaudhary & Kumar (2019) that the records of the *J. bochus* in Delhi are of a breeding population rather than of migrants.

Reference

Chaudhary, R. & V. Kumar. 2019. Sightings of *Jamides bochus* (Stoll, [1782]) and *Prosotas nora* (C. Felder, 1860) (insecta: Lepidoptera: Lycaenidae) from urbanized parts of New Delhi. *Bionotes* 21 (1): 3-4.



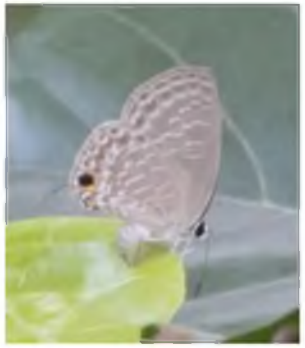


Fig.1 & 2: Oviposition by *Jamides bochus* on nascent buds and leaf of *Millettia pinnata* in Delhi.

ELSEVIER

Gene Reports

Volume 20, September 2020, 100759

Diabetes: Perspective and challenges in modern era

Yamini Goyal [a 1], Amit Kumar Verma [a 1], Deepti Bhatt [a], Arshad Hussain Rahmani [b], Yasheshwar [c], Kapil Dev [a]

Show more

https://doi.org/10.1016/j.genrep.2020.100759

Abstract

Prevalence of diabetes is increasing rapidly due to change in lifestyle and modernization. Other than genetic and lifestyle factors, research has been concentrated in recognizing the effect of in utero conditions and mechanisms of epigenetics in developing diabetes. It emphasizes the need of discovering new methods of prevention focusing on child and maternal health. The Diabetes prevalence is more in developing nations than developed nations. In modern era with the globalization diabetes is a major reason of medical care expenditure and mortality and it is one of the biggest health challenges of current and

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Vertical Motion of the Variable Infinitesimal Mass In the Circular Sitnikov Problem

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Received: May 12, 2020; Accepted: September 18, 2020

Abstract

The circular case of Sitnikov problem is studied here when the infinitesimal body varies its mass according to Jeans law and it is moving along the z-axis which is perpendicular to the orbital plane of the two equal spherical primaries. The two primaries are moving in $xy-$plane on the same circular path. These two primaries are imposing the Newtonian forces on the third variable mass body but not influenced by it. Stability of equilibrium points is examined followed by the derived equations of motion. The time-series solutions of the equation of motion are performed by using the Lindstedt-Poincaré method which is used to remove the secular term. We have numerically performed the time-series which shows that variation parameters have great impact on it.

Keywords: Circular Sitnikov problem; Variable mass; Meshcherskii transformation; Lindstedt-Poincaré method

MSC 2010 No.: 70F15, 70K42, 70F07

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Keywords: Circular Sitnikov problem; Variable mass; Meshcherskii transformation; Lindstedt-Poincaré method

MSC 2010 No.: 70F15, 70K42, 70F07

Published: 10 September 2020

Generalized Elliptic Restricted Four-Body Problem with Variable Mass

Abdullah A. Ansari & Sada Nand Prasad

Astronomy Letters **46**, 275–288 (2020) | Cite this article

169 Accesses | **18** Citations | Metrics

Abstract

The elliptic case of restricted four-body problem with variable mass of infinitesimal body is studied here. The three primary bodies which are placed at the vertices of an equilateral triangle and moving in the elliptical orbits around their common center of mass. Out of these primaries we have considered that one massive body is having radiating effect and other two bodies are oblate in shapes. The fourth body which have infinitesimal mass, are varying its mass according to Jeans law. We derive the equations of motion of the infinitesimal body under the generalized sense in the elliptic restricted four-body problem by using the Meshcherskii-space time transformations. Further we numerically study about the equilibrium points, Poincaré surfaces of section, regions of possible motion and basins of the

THE MOTION PROPERTIES OF THE VARIABLE MASS PLANETOID IN THE ELLIPTICAL SITNIKOV PROBLEM

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July 25, 2020

Abstract

The aim of the study is to investigate the effect of variation parameters due to variable mass of the planetoid in the elliptical Sitnikov problem. Where both primaries are moving in elliptical orbits and imposing the gravitational forces on the third infinitesimal body which varies its mass according to Jeans law and it does not affect the motion of the primaries. Planetoid is moving along perpendicular line (z-axis) to the orbital plane of the primaries. We derive the equation of motion of the planetoid followed by the hamiltonian of the system. Then we solve the equation of motion of the Hill's type equation. And again the time-series solution to the equation with nonlinear force is determined using first the Courant and Snyder transformation followed by the Lindstedt–Poincaré perturbation method which is used to remove the secular term and then an application of Courant and Snyder transformation is used. We have numerically performed the time-series which shows that variation parameters have great impact on it. We also compare our results with the existing results and found significant role of the variation parameters used.

Keywords: Elliptical Sitnikov problem, Variable mass, Jeans law, Courant and Snyder transformation.

1 Introduction

Sitnikov configuration is an interesting problem which starts over decades by K. A. Sitnikov in 1960. This configuration of restricted problem has primaries which are moving either in elliptic or circular path in the same plane while third body is moving on the vertical straight line of the plane of the motion of the primaries. These

THE MOTION PROPERTIES OF THE VARIABLE MASS PLANETOID IN THE ELLIPTICAL SITNIKOV PROBLEM

Abdullah A. Ansari[1,*], Laxmi Narain[2] and Sada Nand Prasad[2]

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2. Acharya Narendra Dev College, University of Delhi, Delhi-100019, India. laxminarain@andc.du.ac.in and sadanandprasad@andc.du.ac.in

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Soft Computing: Theories and Applications pp 107–113 | Cite as

EPQ Model with Product Stewardship Approach

Pratiksha Saxena, Chaman Singh & Kamna Sharma

Conference paper | First Online: 25 November 2017

1155 Accesses | 1 Citations

Part of the Advances in Intelligent Systems and Computing book series (AISC,volume 583)

Abstract

From the past few decades, most of the researchers concentrate on recycling of consumer goods to reduce the impact on environment and health, but now it is time to change our basic approach. In this research paper, we elaborate a nascent issue of product stewardship. Economic production model (EPQ) is a production model in which production occur in a time cycle to fulfill the demand. The proposed model we consider a basic EPQ model with all basic

Indian Journal of Science and Technology

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Year: 2020, Volume: 13, Issue: 37, Pages: 3850-3870

Original Article

Green design and product stewardship approach for two-warehouse inventory model

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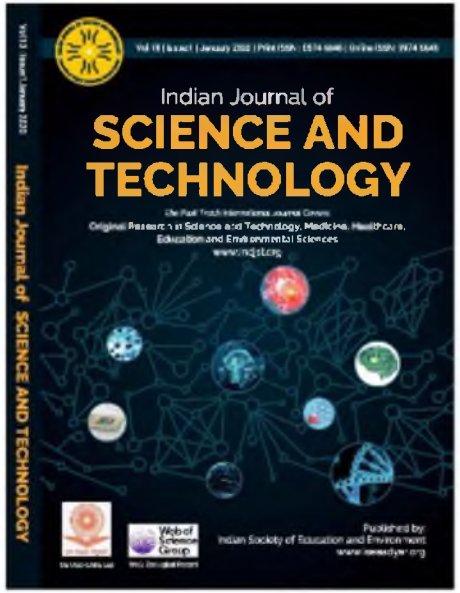

Year: 2020, Volume: 13, Issue: 37

ABSTRACT

Background/Objectives: To trim down the recycling cost of any manufactured goods with the help of green design and product stewardship. **Methods/Statistical analysis:** For the planned EPQ (economic production quantity model) model, all costs are calculated to find total cost and this total cost is optimized with the help of the Hessian matrix. Sensitivity analysis is also carried w.r.t. different parameters, to illustrate the impact of these parameters on the proposed model. The convexity of the total cost function is also checked with the help of mathematical software Mathematica 9.0. **Findings:** Major finding of the proposed model are as follows: (i) Increase in the number of recycles results in the reduction of the total cost. (ii) Product stewardship parameter has a negative effect on total cost as the PS increases from 1 to 4 units, total cost decreases from 5926.00 to 5918.96 units (see Table 9) (similar findings can be written for numeric example 1 after correcting it). (iii) Green design costs have a positive effect on total cost, as the green design cost

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Generalized cr3b Problem with Heterogeneous Primary and Secondary as Finite Straight Segment

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Received: April 4, 2021; Accepted: August 4, 2021

Abstract

The existence and stability of stationary points are investigated under the effects of heterogeneous primary having N-layers with different densities, radiating finite straight segment and the Coriolis as well as centrifugal forces in the frame of cr3bp. The equations of motion are determined with the help of which we evaluate five stationary points analytically as well as graphically, and examine their stability.

Keywords: Restricted three-body problem; Heterogeneous body; Finite straight segment; Radiation pressure; Stationary points

MSC 2010 No.: 70F15, 70F07, 70F05

Outline

ELSEVIER

European Journal of Pharmacology

Volume 890, 5 January 2021, 173741

Review

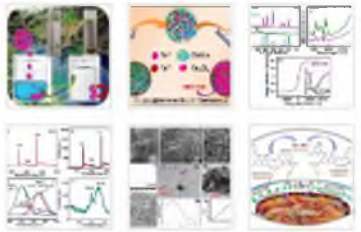
A comprehensive review on potential therapeutics interventions for COVID-19

Heerak Chugh [a 1], Amardeep Awasthi [a 1], Yashi Agarwal [a], Rajesh K. Gaur [c], Gagan Dhawan [d], Ramesh Chandra [a b]

https://doi.org/10.1016/j.ejphar.2020.173741

Abstract

COVID-19 is an infectious respiratory disease caused by SARS-CoV-2, a new beta coronavirus that emerged in Wuhan, China. Being primarily a respiratory disease, it is highly transmissible through both direct and indirect contacts. It displays a range of symptoms in different individuals and thus has been grouped into mild, moderate, and severe diseases. The virus utilizes spike proteins present on its surface to recognize ACE-2 receptors present on the host cells to enter the cell cytoplasm and replicate. The viral invasion of cells induces damage response, pyroptosis, infiltration of immune cells, expression of pro-inflammatory cytokines (cytokine storm), and activation of the adaptive immune system. Depending on viral load and host factors like age and underlying medical conditions, the immune responses mounted against SARS-CoV-2 may cause acute respiratory distress syndrome (ARDS), multiple organ failure, and death. In



Environmental Advances

Volume 2, December 2020, 100014

Fe_3O_4 loaded chitin – A promising nano adsorbent for Reactive Blue 13 dye

Drashya Gautam [a], Laishram Saya [b], Sunita Hooda [a]

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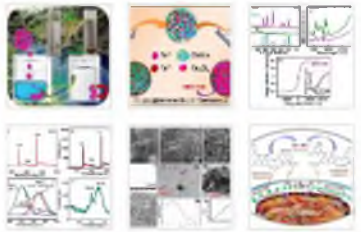
Erratum regarding missing Declaration of Competing Interest statements in previously published articles

Environmental Advances, Volume 7, April 2022, Pages 100139

View PDF

Abstract

Herein we report the development of easily separable, Fe_3O_4 loaded chitin nanomaterial (MCH NM) via simple Co-precipitation route, as a promising adsorbent for removal of Reactive Blue 13 (RB13) dye from aqueous solution in visible light ($\lambda \geq 420$nm). This nanomaterial was characterized using distinctive physicochemical techniques; MCH NM show band gap energy of 2.257eV, evaluated by Tauc's plot using UV–visible spectroscopy. MCH NM show excellent swelling property due to the tendency of the polymer chains to reach elongated configurations at equilibrium beyond which an elastic



Environmental Advances

Volume 2, December 2020, 100014

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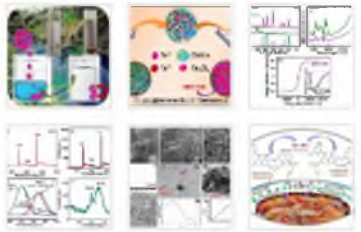

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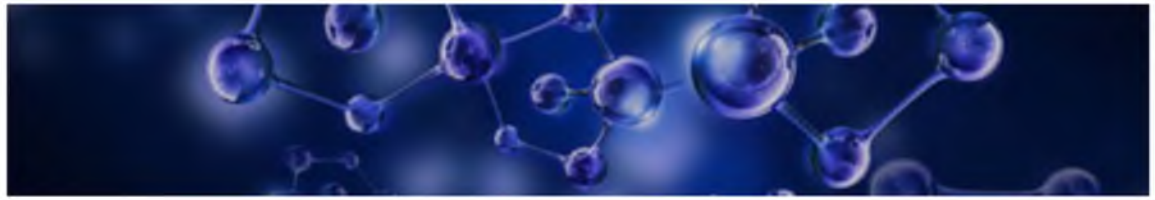

Synthesis of Silver Nanoparticles by *Phyllanthus emblica* Plant Extract and Their Antibacterial Activity

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Artificial Intelligence Assisted Smart Mirror

Amit Garg[1], Prince Sharma[2#], Vivek Verma[3], Shruti Yadav[4], Aman Tyagi[5]

[12345]Department of Electronics, Acharya Narendra Dev College, Govindpuri, New Delhi, India-110019

[#]Email address: princesharma2899@gmail.com

Abstract— According to a survey [1] and research carried out by Today Show and AOL [2], the average person spends 55-56 minutes every day in front of the mirror. In today's fast-moving world, there is a need to manage time very efficiently while being healthy and content in one's life. Considering these observations, this paper constitutes the demonstration and creation of a project aiming to utilize every minute spent in front of a mirror in things like keeping track of mental health and making the best use of smart emerging technologies. In the proposed project idea, this paper presents another interactive smart mirror with some technological capabilities like emotion tracking, voice-activated talking bot with personal assistance, face recognition, the door unlocks, controlling lights, fans, and much more. The proposed mirror also displays day to day schedule, reminders, meetings and engagements fetching all of the required information from the user's Google account and real-time information such as live weather updates, local time, and latest headlines. Moreover, it keeps on displaying positive messages, compliments one's outfit, and greetings depending on what time it is.

Keywords— Smart Mirror, Raspberry PI, Artificial Intelligence, node.js, Python, JavaScript, Two-way mirror

I. INTRODUCTION

It is said that every second count and the saying is considered to be among the best of letter and spirit. There is rarely a home on earth without a mirror. Normally, a majority of people spend almost half of an hour in front of a mirror on a daily basis. With the advancement in technology the mirror should also adapt to move towards many emerging technologies like smartphones, tablets and laptops. The proposed solution to the problem is to turn the mirror into a Smart Electronic device like Alexa, Google Assistant.

Taking advantage of AI technology it is embedded in it to make smart and usable in all technological aspects. The most important goals of the Smart Mirror are to save the user's time and consequently, help in being more productive and also to allow receive all the updates on a timely basis. A smart mirror also reduces the great haste of completing morning routines by

II. RELATED WORK

The proposed smart mirror facilitates access to personalized services such as assistance, emotion tracking, face recognized door unlocks, retrieval of important engagements and notifications from user's Google account, real-time weather updates, and news headlines. Even while functioning as an ordinary mirror, it complements the user's outfit and greets concerning the time.

Some of the previous works in this field are written briefly in this section.

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ELSEVIER

Journal of Alloys and Compounds

Volume 830, 25 July 2020, 154641

Enhancement in NH_3 sensing performance of ZnO thin-film via gamma-irradiation

Maqsood R. Waikar [a], Pooja M. Raste [a], Rakesh K. Sonker [b], Vinay Gupta [b], Monika Tomar [c], Mahendra D. Shirsat [d], Rajendra G. Sonkawade [a]

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https://doi.org/10.1016/j.jallcom.2020.154641

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Abstract

In this work, chemically synthesized Zinc Oxide (ZnO) thin films were exposed to Cobalt-60 (Co-60), 1.25 MeV average energy of gamma source at different doses for possible augmentation in NH_3 sensing. The hexagonal crystalline structure was confirmed by XRD spectra and an enhancement in crystallite size was observed with an increase in radiation followed by decrease at 50 kGy dose. The FTIR spectra showed there were no significant changes in the peak position after gamma-irradiation. The morphological investigation showed the maturation of 1D ZnO hexagonal nanorods over the surface of the film. However, after gamma-irradiation, the ZnO nanorods were found connected, forming bunches. The band-gap increased for 50 kGy doses as compared to pristine ZnO thin film. However, characterization result analysis showed that gamma-irradiation produced conspicuous improvements in chemically prepared ZnO microstructure. It was found that post-irradiated (at 20 kGy) ZnO thin film sensor achieved 7.20 as response

Outline

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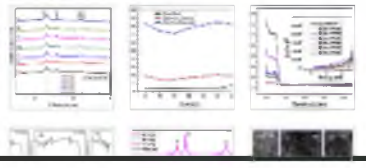

ELSEVIER

Materials Science in Semiconductor Processing

Volume 110, May 2020, 104975

Post-γ -irradiation effects on structural, optical and morphological properties of chemical vapour deposited MWCNTs

Maqsood R. Waikar [a], Rakesh K. Sonker [b], Sakshi Gupta [c], Shiv Kumar Chakarvarti [d], Rajendra G. Sonkawade [a]

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Highlights

- The crystallite size increases with increasing γ dose at 60 kGy as compared to pristine MWCNTs.
- Bandgap and structural parameters d, ε, δ and g decreases with increasing γ dose as compared to pristine MWCNTs.
- FTIR spectra peak shifted after γ irradiation is the evidence of changes in the structure of the MWCNTs.
- Raman spectra show the structural ordering at high dose (60 kGy) of MWCNTs.

J. Biol. Chem. Research. Vol. 37, No. 1, 180-187, 2020
(An International Peer Reviewed / Refereed Journal of Life Sciences and Chemistry)
Ms 37/01/3355/2020

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RESEARCH PAPER

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Chemistry and Pharmacology of Miraculous *Echinacea purpurea* L.

Asha Verma, *Dinesh Kumar Arya and **Raaz K. Maheshwari
Department of Chemistry, University of Rajasthan, Jaipur, Rajasthan, India
*Department of Chemistry, Acharya Narendra Dev College, Delhi, India
**Department of Chemistry, SBRM Govt. P.G. College, Nagaur, Rajasthan, India

ABSTRACT

Echinacea purpurea L. (EP) is one of the most important perennial medical herbs with enormous pharmacological and aesthetic properties. Mainly Echinacea is focused on its immunomodulatory effects, anti-inflammatory, antimicrobial, antiviral, antifungal and urinary tract infections. Other aspects of its beneficial effects viz. antioxidant, antibacterial, antiviral, and larvicidal activities antianxiety, antidepression, cytotoxicity, and antimutagenicity as induced by the plant have been revealed in various studies. The chemistry and its pharmacological actions are well documented. Several groups of

Advances in Zoology and Botany 8(1): 12-19, 2020
DOI: 10.13189/azb.2020.080103

Optimizing Synthesis of *Citrus limetta* Peel Silver Nanocomposites Possessing Larvicidal Potential against Dengue Vector, *Aedes aegypti* L.

Devina Aggarwal[1], Aarti Sharma[2], Sarita Kumar[3,*]

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Received October 13, 2019; Revised November 25, 2019; Accepted December 4, 2019

Abstract *Aedes aegypti* L. is the major vector accountable for the spread of several diseases of medical importance. The control strategies primarily relying on chemical insecticides have caused negative impact on our environment and human health. Thus, current study employed *Citrus limetta* peel extracts (CLPE) against larvae of *Ae. aegypti*. Silver nanocomposites (AgNCs) from CLPE were synthesised and the process of synthesis was optimized by varying temperature; volume and concentration of silver nitrate solution; and the volume of catalyst. A conspicuous change in colour of the reaction mixture was noticed from pale yellow to dark brown. This diseases; like Yellow fever, Zika, Dengue fever and Chikungunya; has captivated attention of researchers, health organizations and vector control bodies. In the last few decades, the prevalence of *Aedes*-borne diseases; especially dengue; has augmented extensively at global level. According to World Health Organization, almost half of the world's population (3.9 billion) residing in 128 countries is prone to the dengue infection while more than 100 countries are endemic to dengue [1]. According to Union Health Ministry of India, the infections and fatalities caused by dengue virus are rising in India year by year raising serious concerns about the vector control.

Article | Open Access | Published: 06 May 2021

pH induced conformational alteration in human peroxiredoxin 6 might be responsible for its resistance against lysosomal pH or high temperature

Rimpy Kaur Chowhan, Sunaina Hotumalani, Hamidur Rahaman & Laishram Rajendrakumar Singh

Scientific Reports **11**, Article number: 9657 (2021) | Cite this article

999 Accesses | **11** Citations | Metrics

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Sections | Figures | References

Abstract

Introduction

Materials and methods

Results

Discussion

Summary

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Acknowledgements

Author information

Ethics declarations

Additional information

Supplementary Information

Abstract

Peroxiredoxin 6 (Prdx6), the ubiquitously expressed enzyme belonging to the family of peroxidases, namely, peroxiredoxins, exhibits a unique feature of functional compartmentalization within cells. Whereas, the enzyme localized in cytosol shows glutathione peroxidase activity, its lysosomal counterpart performs calcium independent phospholipase A2 (aiPLA2) activity. Like any true moonlighting protein, these two activities of Prdx6 are mutually exclusive of each other as a function of the pH of the cellular compartments. Differential substrate preference at different pH (i.e. peroxidised phospholipids at neutral pH and reduced phospholipids at acidic pH) is considered to be the reason for this behavior. To gain insight into the pH-induced structural–functional interplay we have systematically evaluated

Review Paper | Published: 12 June 2021

Exploiting Emojis in Sentiment Analysis: A Survey

Vandita Grover

Journal of The Institution of Engineers (India): Series B **103**, 259–272 (2022) | Cite this article

917 Accesses | **3** Citations | Metrics

Abstract

Sentiment analysis is now a prominent field of interest owing to a growing trend of users expressing their opinions on social media, review pages, feedback forms, and other online channels. The machine learning approach to sentiment analysis focuses on feature extraction methods like constructing lexicons to learn sentiment polarity or learning word embeddings and applying them for their use in machine learning algorithms for sentiment classification. But most popular machine learning approaches still cannot capture nuanced emotions like sarcasm, irony, etc. Emojis are now being used along with text by the users to express emotions and hence can help researchers improve sentiment classification tasks. Sentiment analysis powered by emojis is still in the nascent phase and has gained some pace in the last five years. The primary goal of this paper is to discuss the use of emojis that supplement the

Materials Technology ›
Advanced Performance Materials
Volume 37, 2022 - Issue 10

Research Article

Optimisation of dielectric spacer layer thickness in Ag nanospheres/ITO/c-Si structure for plasmonic solar cells using FDTD simulation

Manju Rani, Jyoti Kashyap, Udaibir Singh & Avinashi Kapoor

Pages 1320-1328 | Received 27 Apr 2021, Accepted 01 Jun 2021, Published online: 15 Jun 2021

Download citation https://doi.org/10.1080/10667857.2021.1940046 Check for updates

ABSTRACT

The thickness of dielectric spacer layer (DSL) plays an important role in performance of plasmonic solar cells. In this work, effect of thickness variation of ITO (indium tin oxide) DSL in silver (Ag) nanospheres/ITO/crystalline silicon(c-Si) structure on forward and backward scattering efficiencies has been investigated. Simulations were carried out using the open-source software MEEP via FDTD method for Ag nanospheres of sizes 50nm, 80nm and 100nm. Maximum forward scattering was observed with 80nm

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Original Paper | Published: 06 January 2021

Applicability of Field Plate in Double Channel GaN HEMT for Radio-Frequency and Power-Electronic Applications

Nisha Chugh, Manoj Kumar, Subhasis Haldar, Monika Bhattacharya & R.S. Gupta

Silicon **14**, 1029–1038 (2022) | Cite this article

Abstract

In the present communication, for the first time, applicability of Field Plate (FP) for Double Channel (DC) AlGaN/GaNHEMT is demonstrated. Impact of design space parameters such as field plate length (L_{FP}) and Silicon Nitride thickness (t_{SiN}) on breakdown voltage of DC HEMT is investigated and benchmarked with Single Channel (SC) HEMT. The investigation is carried out using ATLAS Technological Computer Aided Design (TCAD) Simulation tool, which is an efficient method in terms of time and cost to analyze and understand DC HEMT prior to the fabrication. The simulation shows new findings that breakdown voltage of DC device exhibited a large deviation with that of SC device. The breakdown voltage deviation is well corroborated

Recent Advances in Polymer Solar Cells

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Gamma Rays Induced Modification in Ultrahigh Molecular Weight Polyethylene (UHMWPE)

Suveda Aarya,[1] Pawan Kumar,[2] Mamta Bhatia,[2] Sanjeev Kumar,[3] Jyotsna Sharma,[4] and **Siddhartha**[2]

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Academic Editor: Zeyun Xiao

Received	Revised	Accepted	Published
26 Jul 2020	16 Apr 2021	26 May 2021	08 Jun 2021

Abstract

Modifications taking place in ultrahigh molecular weight polyethylene (UHMWPE) films due to gamma ray radiation-induced and investigated in correlation with the applied doses. Films were irradiated in a vacuum at room temperature by a 1.25 MeV Co^{60} a source with doses ranging from 0 to 300 kGg. The optical, chemical, structural, and surface morphological properties of the irradiated and unirradiated UHMWPE films

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Superficial Synthesis of CdS Quantum Dots for an Efficient Perovskite-Sensitized Solar Cell

Rakesh K. Sonker*, Rajkamal Shastri, and Rahul Johari

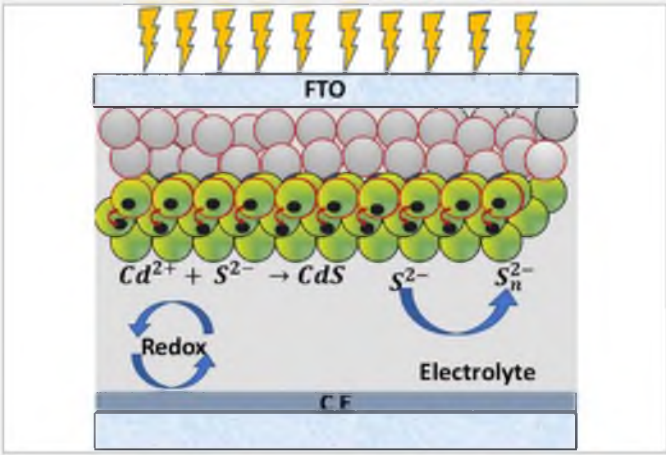
Cite this: *Energy Fuels* 2021, 35, 9, 8430–8435
Publication Date: April 9, 2021
https://doi.org/10.1021/acs.energyfuels.1c00629

SUBJECTS: Cadmium sulfide, Chemical structure, Nanoclusters, Quantum dots,

Energy & Fuels

Abstract

In this paper, a thorough investigation of cadmium sulfide nanoparticle characteristics has been studied as a result of the wide attention and enormous application in a solar cell. Perovskite-sensitized solar cells (PSSCs) are a favorably effectual and sanitary hybrid, organic–inorganic solar cell device. The simple way uses synthesized cost-effective CdS quantum dots (QDs) via the sol–gel approach and also investigates their structural, electronic, and vibrational properties of CdS nanoparticles with the density functional theory method in B3LYP. Moreover, we use high-resolution transmission electron microscopy (HRTEM) techniques to confirm our calculations and acquire good agreement to the structural analysis of CdS QD formation. The maximum grain diameter is obtained from a HRTEM image, at ~4 nm. The particle size analyzer that obtained ~4 nm of CdS QD nanoparticles was determine via a dynamic light scattering study. The results demonstrated that the fabricated CdS QD-based dye-sensitized solar cell and PSSC represented a maximum power conversion efficiency (η) of 0.5 and 1.8% at 1 sun condition. This efficiency was improved by approximately 72%, associated with that of the reference cell.



Original Research Article | Published: 03 March 2021

Influence of lufenuron on the nutrient content and detoxification enzyme expression in *Aedes aegypti* L. (Diptera: Culicidae)

Kungreiliu Panmei, Roopa Rani Samal, P. Lanbiliu & Sarita Kumar

International Journal of Tropical Insect Science **41**, 2965–2973 (2021) | Cite this article

Abstract

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Original Research Article | Published: 03 March 2021

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International Journal of Tropical Insect Science **41**, 809–820 (2021) | Cite this article

229 Accesses | **8** Citations | Metrics

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PDF

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Sanskriti School, New Delhi, India
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Insect Pest and Vector Laboratory, Department of Zoology, Acharya Narendra Dev College, University of Delhi, India
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Insect Pest and Vector Laboratory, Department of Zoology, Acharya Narendra Dev College, University of Delhi, India

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Aedes aegypti, is a well-known vector of dengue, Chikungunya and Zika at the global level. Primary use of pyrethroids as control interventions has caused the development of a considerable level of immunity in *Ae. aegypti*. The current study assessed the efficacy of a pyrethroid, ?-cypermethrin on the survival and various life parameters of *Ae. aegypti*. The larvicidal studies with ?-cypermethrin revealed the respective LC_{50} and LC_{90} values as 0.26526 mg/L and 0.60211 mg/L. The impact of LC_{50} level was assessed on the growth and life attributes; such as gonotrophic cycle, egg development, hatchability, development and survival of immature stages, adult longevity, reproduction rate and generation time: of fourth instar of susceptible (S) and ?-cypermethrin-exposed population (E). The exposed population showed diminished

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M. Kumar, P. Kumar, P. Das, R. Solanki & M. K. Kapur

International Journal of Environmental Science and Technology **19**, 10457–10476 (2022) | Cite this article

641 Accesses | **2** Citations | Metrics

Abstract

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REVIEW ARTICLE OPEN ACCESS

Exploring Small Heat Shock Proteins (sHSPs) for Targeting Drug Resistance in *Candida albicans* and other Pathogenic Fungi

Rahul Dev

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Abstract

Fungal infections have predominantly increased worldwide that leads to morbidity and mortality in severe cases. Invasive candidiasis and other pathogenic fungal infections are a major problem in immunocompromised individuals and post-operative patients. Increasing resistance to existing antifungal drugs calls for the identification of novel antifungal drug targets for chemotherapeutic interventions. This demand for identification and characterization of novel drug targets leads to the development of effective antifungal therapy against drug resistant fungi. Heat shock proteins (HSPs) are important for various biological processes like protein folding, posttranslational modifications, transcription, translation, and protein aggregation. HSPs are involved in maintaining homeostasis of the cell. A subgroup of HSPs is small heat shock proteins (sHSPs), which functions as cellular chaperones. They are having a significant role in the many cellular functions like development, cytoskeletal organization, apoptosis, membrane lipid polymorphism, differentiation, autophagy, in infection recognition and are major players in various stresses like osmotic stress, pH stress, etc. Studies have shown that fungal cells express increased levels of sHSPs upon antifungal drug induced stress responses. Here we review the important role of small heat shock proteins (sHSPs) in fungal diseases and their potential as antifungal targets.

Keywords: *Candida albicans*, Drug resistance, Small heat shock proteins, Antifungals

European Journal of Protistology

Volume 79, June 2021, 125779

Characterization of *Euplotes lynni* nov. spec., *E. indica* nov. spec. and description of *E. aediculatus* and *E. woodruffi* (Ciliophora, Euplotidae) using an integrative approach

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https://doi.org/10.1016/j.ejop.2021.125779

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Four species belonging to the genus *Euplotes* have been investigated, namely: *E. lynni* nov. spec., *E. indica* nov. spec., *E. aediculatus*, and *E. woodruffi*. All populations are from India and were investigated using morphological and molecular markers. The phylogenetic relationships were inferred from small subunit ribosomal rRNA gene (SSU rRNA), internal transcribed spacer (ITS) region, and mitochondrial cytochrome c oxidase subunit I (COI) gene. Predicted secondary structure models for two new species using the hypervariable region of the SSU rRNA gene and ITS2 region support the distinctness of both species. Morphological characters were subjected to principal component analysis (PCA) and genetic variations were studied in-depth to analyze the relatedness of the two new species with their congeners. An integrative approach combining morphological features, molecular analysis, and ecological characteristics was carried out to understand the phylogenetic position of the reported species within the different clades of the genus *Euplotes*.

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Carbohydrate Polymers

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Review

Guar gum based nanocomposites: Role in water purification through efficient removal of dyes and metal ions

Laishram Saya [a d], Vipin Malik [b], Aarushi Singh [c e], Snigdha Singh [c e], Geetu Gambhir [b], W. Rameshwor Singh [d], Ramesh Chandra [c], Sunita Hooda [b]

https://doi.org/10.1016/j.carbpol.2021.117851

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Researchers nowadays are relentlessly on a race exploring sustainable materials and techniques for the sequestration of toxic dyes and metal ions from water bodies. Biopolymers such as guar gum, owing to its high abundance, low cost and non-toxicity, are potential candidates in this field. Plenty of hydroxyl groups in the polymer backbone enable guar gum to be functionalised or grafted in a versatile manner proving itself as an excellent starting substance for fabricating upgraded materials meant for diverse applications. This review offers a comprehensive coverage of the role of guar gum-based nanocomposites in removal of dyes and heavy metal ions from waste water through adsorption and photo-catalytic degradation. Isotherm and kinetics models, fabrication routes, characterisation techniques, swelling properties and reusability as well as adsorption and degradation mechanisms are outlined. A detailed analysis with convincing results suggests a good future perspective of implementation of these materials in real-time wastewater treatment technology.

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Volume 11 - 2020 | https://doi.org/10.3389/fmicb.2020.607099

This article is part of the Research Topic
Insights into New Strategies to Combat Biofilms
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[1] Acharya Narendra Dev College, University of Delhi, Delhi, India
[2] Nucleic Acids Research Laboratory, CSIR-Institute of Genomics and Integrative Biology, Delhi, India

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Original Paper | Published: 22 September 2020

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Indu Singh, Seema Gupta, Hemant K. Gautam, Gagan Dhawan & Pradeep Kumar

Chemical Papers **75**, 979–991 (2021) | Cite this article

241 Accesses | **7** Citations | Metrics

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Applications of Chitosan in Tissue Engineering

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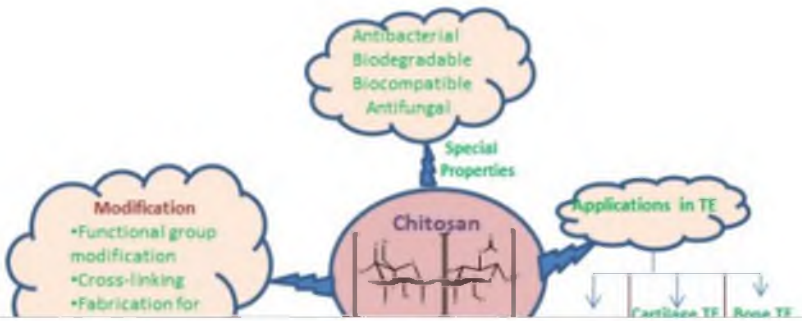
GRAPHICAL ABSTRACT



Trends In Carbohydrate Research, Vol.13, No.1 (2021) 71-81

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Trends in Carbohydrate Research

website: www.trendscarbo.com

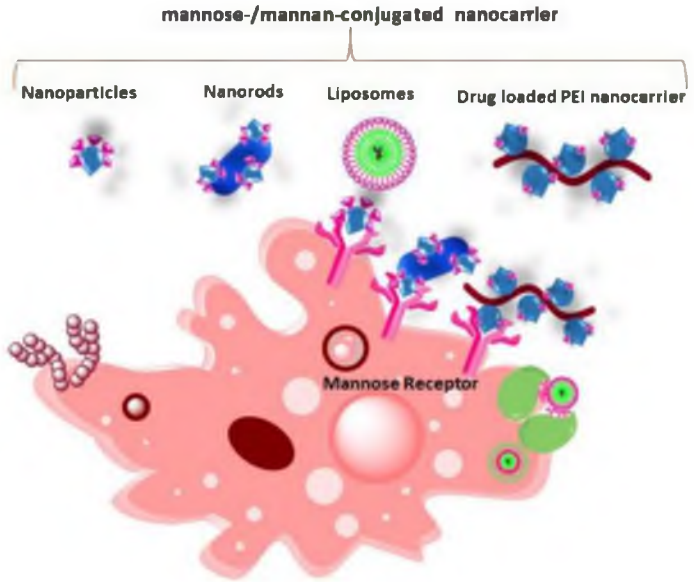
Mannosylated and mannan-modified nanovectors targeting Resident Tissue Macrophages (RTM) for efficient pharmacotherapy

Indu Singh,[1,2] Seema Gupta,[2] Gagan Dhawan,[2] Pradeep Kumar[1]*

[1]CSIR-Institute of Genomics and Integrative Biology, Mall Road, Delhi-110007, India
[2]Acharya Narendra Dev College (University of Delhi), Govindpuri, Kalkaji, New Delhi- 110019, India

Received: January 01, 2021, Revised: March 28, 2021, Accepted: March 30, 2021

Graphical Abstract



Abstract

Nanovectors advocate extensive scientific advancement for feeding safe and efficient pharmaceutical delivery systems. Embraced as both organic and inorganic vectors, these nanovectors can be designed and engineered with various layers of

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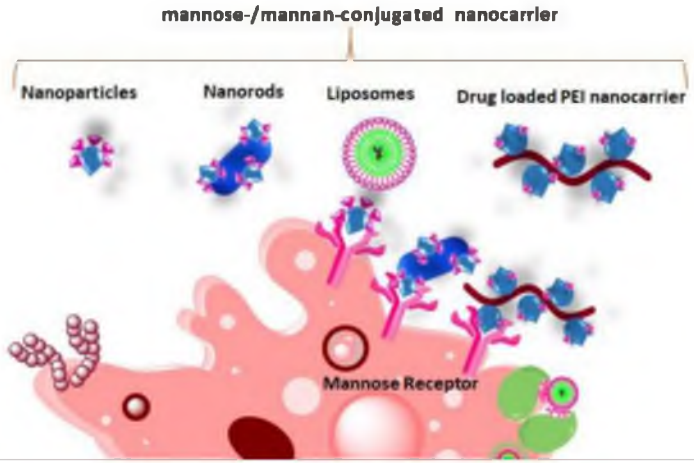

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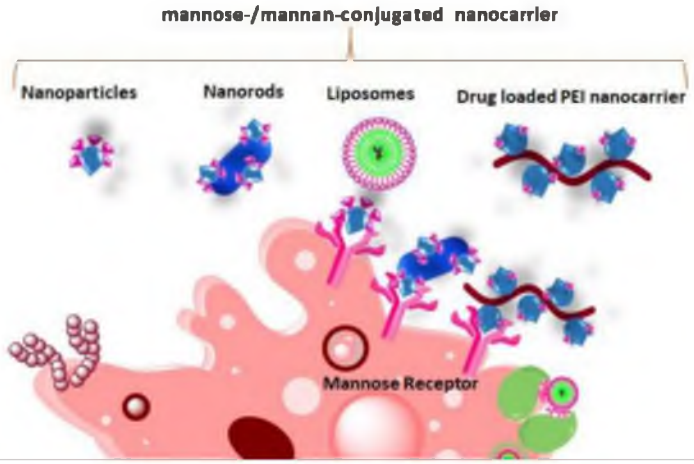

Review Article

A review targeting the infection by CHIKV using computational and experimental approaches

Durgesh Kumar, Kamlesh Kumari, Ramesh Chandra, Pallavi Jain, Lata Vodwal, Geetu Gambhir & ...show all

Pages 8127-8141 | Received 04 Jun 2020, Accepted 11 Mar 2021, Published online: 30 Mar 2021

Download citation | https://doi.org/10.1080/07391102.2021.1904004

Abstract

The rise of normal body temperature of 98.6 °F beyond 100.4 °F in humans indicates fever due to some illness or infection. Viral infections caused by different viruses are one of the major causes of fever. One of such viruses is, Chikungunya virus (CHIKV) is known to cause Chikungunya fever (CHIKF) which is transmitted to humans through the mosquitoes, which actually become the primary source of transmission of the virus. The genomic structure of the CHIKV consists of the two open reading frames (ORFs). The first one is a 5' end ORF and it encodes the nonstructural protein (nsP1-nsP4). The second is a 3' end ORF and it encodes the structural proteins, which is consisted of capsid, envelope (E), accessory peptides, E3 and 6 K. Till date, there is no effective vaccine or medicine available for early detection of the CHIKV infection and appropriate diagnosis to cure the patients from the infection. NSP3 of CHIKV is the prime target of the researchers as it is responsible for the catalytic activity. This review has updates of literature on CHIKV; pathogenesis of CHIKV; inhibition of CHIKV using theoretical and experimental approaches.

Communicated by Ramaswamy H. Sarma

Keywords: CHIKV | docking | MD simulations | inhibition

LUMINESCENCE

Volume 36, Issue 6
September 2021
Pages 1531-1543

RESEARCH ARTICLE

Synthesis, comparative *in vitro* antibacterial, antioxidant and UV fluorescence studies of bis indole Schiff bases and molecular docking with ct-DNA and SARS-CoV-2 M^{pro}

Sugandha Singhal, Pankaj Khanna, Leena Khanna

First published: 04 June 2021 | https://doi.org/10.1002/bio.4098 | Citations: 11

Funding information: Guru Gobind Singh Indraprastha University, Grant/Award Number: FRGS; Faculty Research Grant Scheme (FRGS)

Read the full text > PDF TOOLS SHARE

Abstract

In this study, synthesis of 15 novel bis indole-based Schiff bases (SBs) **4a**–**4o** was conducted by condensation of 2-(1-aminobenzyl)benzimidazole with symmetrical bis-

ChemistrySelect
Chemistry Europe
European Chemical Societies Publishing

Volume 6, Issue 17
May 7, 2021
Pages 4112-4123

Full Paper

Multitarget Diallyl Disulfides (DADS) against Aβ Aggregation: Screening through Molecular Docking with $Aβ_{42}$ & Zn^{II}-$Aβ_{16}$, ADME, DFT & Synthetic Strategy

Sugandha Singhal, Dr. Pankaj Khanna, Dr. Neeti Misra, Dr. Leena Khanna

First published: 30 April 2021 | https://doi.org/10.1002/slct.202004635 | Citations: 1

Read the full text ›

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ChemistrySelect
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First published: 30 April 2021 | https://doi.org/10.1002/slct.202004635 | Citations: 1

Biotechnologically relevant enzymes and proteins | Published: 16 April 2021

Screening of compound library identifies novel inhibitors against the MurA enzyme of *Escherichia coli*

Diksha Raina, Harshita Tiwari, Smriti Sharma, Deepika, Praveen Kumar Chinthakindi, Amit Nargotra, Payare L. Sangwan, Kandasamy Eniyan, Urmi Bajpai, Ram A. Vishwakarma, Farrah Gul Khan, Saurabh Saran & Inshad Ali Khan

Applied Microbiology and Biotechnology **105**, 3611–3623 (2021) | Cite this article

Abstract

Bacterial cell has always been an attractive target for anti-infective drug discovery. MurA (UDP-*N*-acetylglucosamine enolpyruvyl transferase) enzyme of *Escherichia coli* (*E.coli*) is crucial for peptidoglycan biosynthetic pathway, as it is involved in the early stages of bacterial cell wall biosynthesis. In the present study we aim to identify novel chemical structures targeting the MurA enzyme. For screening purpose, we used *in silico* approach (pharmacophore based strategy) for 52,026 library compounds (Chembridge, Chemdiv and in house synthetics) which resulted in identification of 50 compounds. These compounds were screened in vitro against MurA enzyme and release of inorganic phosphate (Pi) was estimated. Two compounds (IN00152 and IN00156) were found to inhibit MurA enzyme > 70% in primary screening and IC_{50} of 14.03 to 32.30 µM respectively. These two hits were further evaluated for their mode of inhibition studies and whole-cell activity where we observed 2-4 folds increase in activity in presence of Permeabilizer EDTA (Ethylenediaminetetraacetic

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SHELTER BUILDING BEHAVIOUR OF *HASORA CHROMUS* (CRAMER, 1780) LARVAE (INSECTA: LEPIDOPTERA: HESPERIIDAE)

RAJESH CHAUDHARY
Department of Biomedical Science, Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, New Delhi-110019, India.
rajeshchaudhary@andc.du.ac.in

Reviewer: Peter Smetacek

Abstract
Larvae of many lepidopterans, including those belonging to the family Hesperiidae, construct leaf shelters. It has been indicated that these shelters confer protection to larvae from predators and harsh environmental conditions. The repertoire of shelter architectures constructed by given genera or species of Hesperiidae is fairly predictable. Thus, shelter building behaviour can also be important from the perspective of evolution. The present study provides an insight into shelter building behaviour of larvae of Common Banded Awl, *Hasora chromus* (Cramer), including various designs of shelter that larvae can make, and the role of shelters protection from predators. *H. chromus* larvae were found to construct at least four broad architectural types of shelters by folding and tying leaves. The shelters function as a barrier for arthropod predators (including wasps and spiders), and also effective in protecting larvae from avian predators too.
Keywords: Common Banded Awl, *Hasora chromus*, Hesperiidae, Larva, Ecobiology, Shelter-building, Predation, Protection.

Introduction

Larvae of lepidopterans have devised several ways to protect themselves from predators as well as environmental conditions such as solar heat, dislodgement due to shaking or wind blow (Greeney et al., 2015). Their protective strategies include chemical, physiological, morphological, and behavioural defences association with other organisms and avoiding encounters with predators by constructing shelters (Greeney et al., 2015). The latter strategy, *i.e.* shelter making, is widely utilized by larvae of Hesperiidae (Greeney et al., 2003). The larvae of this butterfly family construct shelters with a diverse array of architecture through precisely executed actions, including cutting, rolling, folding and tying a portion or whole of a leaf or several species is largely predictable, and this may be important from the point of view of phylogeny of this group of butterflies (Greeney et al., 2003, 2010; Greeney 2009). However, studies on shelter building behaviour, architectural details of shelter and its protective values (protection from predators and harsh environment) for larvae have not received much attention, particularly for Indian hesperids. In the present communication, these aforementioned aspects have been reported for Common Banded Awl (*Hasora chromus* Cramer, 1780), a common hesperid butterfly found in most parts of India. *Hasora chromus* lays eggs singly or in groups of 2-3 eggs on nascent leaves of its host plant. There are five larval instars, live in self-constructed leaf

Appl. Math. Inf. Sci. 15, No. 2, 189-197 (2021)

Applied Mathematics & Information Sciences
An International Journal

http://dx.doi.org/10.18576/amis/150211

Properties of Motion of the Infinitesimal Variable Mass Body in the Well Known Circular Restricted Three-Body Problem with Newtonian and Yukawa Potential

Abdullah A. Ansari[1,*], *Mehtab Alam*[1], *Kalu Ram Meena*[2] *and Ashraf Ali*[3]

[1]International Center for Advanced Interdisciplinary Research (ICAIR), Ratiya Marg, Sangam Vihar, New Delhi, India
[2]Department of Mathematics, Acharya Narendra Dev College,University of Delhi, Delhi-110019, India
[3]Faculty of Computer Studies, Arab Open University, Kingdom of Bahrain

Received: 2 Jan. 2021, Revised: 3 Feb. 2021, Accepted: 25 Feb 2021
Published online: 1 Mar. 2021

Abstract: The effects of Newtonian and Yukawa gravitational potentials are studied on the circular restricted three-body system under the assumption that infinitesimal body varies its mass according to Jeans law. The equations of motion are determined under these perturbations. The numerical studies are conducted where locations of equilibrium points, regions of motion, trajectories with Poincaré surfaces of section and the basins of attraction have been investigated by well known software Mathematica. Moreover, the stability of the locations of equilibrium points are determined and it was found that all these points are unstable.

Keywords: Attracting domain, Newtonian potential, Variable mass, Trajectories, Yukawa potential.

1 Introduction

[6], [7], [8], [9], have explored the effect of oblateness on

American Journal of Mathematical and Management Sciences ›
Volume 40, 2021 - Issue 4

Research Article

On Estimating Scale Parameter of the Selected Pareto Population under the Generalized Stein Loss Function

K. R. Meena, Aditi Kar Gangopadhyay & Omer Abdalghani

Pages 357-377 | Published online: 19 Mar 2021

Download citation | https://doi.org/10.1080/01966324.2021.1891999

Abstract

The problem of estimation after selection can be seen in numerous statistical applications. Let $X_{i1}, \ldots, X_{in}$ be a random sample drawn from the population $\Pi_i, i = 1, \ldots, k$, where Π_i follows Pareto distribution with an unknown scale parameter θ_i and common known shape parameter β. This article is concerned with the problem of estimating θ_L (or θ_S), the scale parameter of the selected Pareto population under the generalized Stein loss function. The uniformly minimum risk unbiased (UMRU) estimators of θ_L and θ_S, scale parameters of the largest and the smallest population respectively, are determined. For $k = 2$, we have obtained a sufficient condition of minimaxity of θ_S and showed that the generalized Bayes estimator of θ_S is a minimax estimator for $k = 2$. Also, a class of linear admissible estimators of the form $dX_{(2)}(dX_{(1)})$ of θ_L and θ_S is found, and a sufficient condition for inadmissibility is provided. Further, we demonstrate that the UMRU estimator of θ_S is inadmissible. A comparison between the proposed estimators is conducted using MATLAB software and a real data set is analyzed for illustrative purposes. Finally, conclusions and discussion are reported.

KEY WORDS AND PHRASES: Generalized Bayes estimators | generalized Stein loss (GSL) function | inadmissibility | minimaxity | Pareto distributions | UMRU estimator

Alternative Treatment Strategies for Secondary Bacterial and Fungal Infections Associated with COVID-19

Review | Open Access | Published: 22 November 2021 | 11, 53–78 (2022)

Infectious Diseases and Therapy

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Ritam Das, Komal Kotra, Pulkit Singh, Belinda Loh, Sebastian Leptihn & Urmi Bajpai

A Correction to this article was published on 25 January 2022

This article has been updated

Abstract

Antimicrobials are essential for combating infectious diseases. However, an increase in resistance to them is a major cause of concern. The empirical use of drugs in managing COVID-19 and the associated secondary infections have further exacerbated the problem of antimicrobial resistance. Hence, the situation mandates exploring and developing efficient alternatives for the treatment of bacterial and fungal infections in patients suffering from COVID-19 or other viral infections. In this review, we have described the alternatives to conventional antimicrobials that have shown promising results and are at various stages of

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Synthesis and Characterization of Nanoselenium: A Step-by-Step Guide for Undergraduate Students

Gagan Dhawan*, Indu Singh, Uma Dhawan*, and Pradeep Kumar*

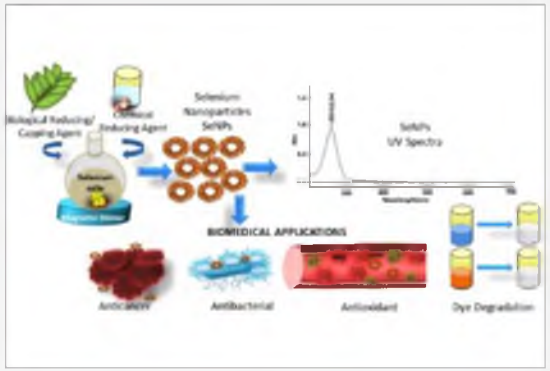
Cite this: *J. Chem. Educ.* 2021, 98, 9, 2982−2989
Publication Date: August 20, 2021
https://doi.org/10.1021/acs.jchemed.0c01467

Journal of Chemical Education

Read Online | PDF (5 MB)

SUBJECTS: Metal nanoparticles, Nanoparticles, Selenium, Sodium, Students

Abstract



Nanoparticle synthesis is an important area of nanotechnology and has been performed by undergraduate students frpm various universities across the globe. Due to the availability of massive data on the synthesis of a wide variety of metallic nanoparticles, including silver, gold, selenium, zinc, copper, iron, palladium, platinum, titanium, etc., and their oxides, it has become tedious to select an ideal and workable protocol for their synthesis. Herein, we have focused on the standardized chemical and biological methodologies to prepare selenium nanoparticles (SeNPs or nanoselenium). Chemical methods exploit chemicals such as sodium selenite (Na_2SeO_3) and reductants (L-ascorbic acid, glutathione, etc.), along with stabilizing agents (Polysorbate 20, protic acid, lysozyme). Although these methods have been used for commercial purposes, they suffer from several drawbacks such as the use of excessive additives for controlled morphology, multistep synthesis, high running cost, and environmental toxicity. Biogenic synthesis using plant materials and microorganisms (algae, fungi, yeast, bacteria, and viruses), on the other hand, is a sustainable, environment-friendly, and cost-effective approach. The natural reducing agents facilitate the conversion of selenium salts into nanosized selenium particles in a single step and act as capping and stabilizing agents, which impart synergism in biological activities. Physical methods such as hydrothermal, irradiation, pulsed laser ablation, etc., have also been used for their production; however, high cost, stringent conditions, and high energy consumption have hampered their applications. Herein, we present a step-by-step methodology using chemical and biological reducing agents to synthesize selenium nanoparticles which will assist the undergraduate learners in selecting a well-tested method based on the conditions of an experiment and desired applications.

KEYWORDS: Second-Year Undergraduate, Upper-Division Undergraduate, Interdisciplinary/Multidisciplinary, Laboratory Instruction, Hands-On Learning/Manipulatives, Applications of Chemistry, Green

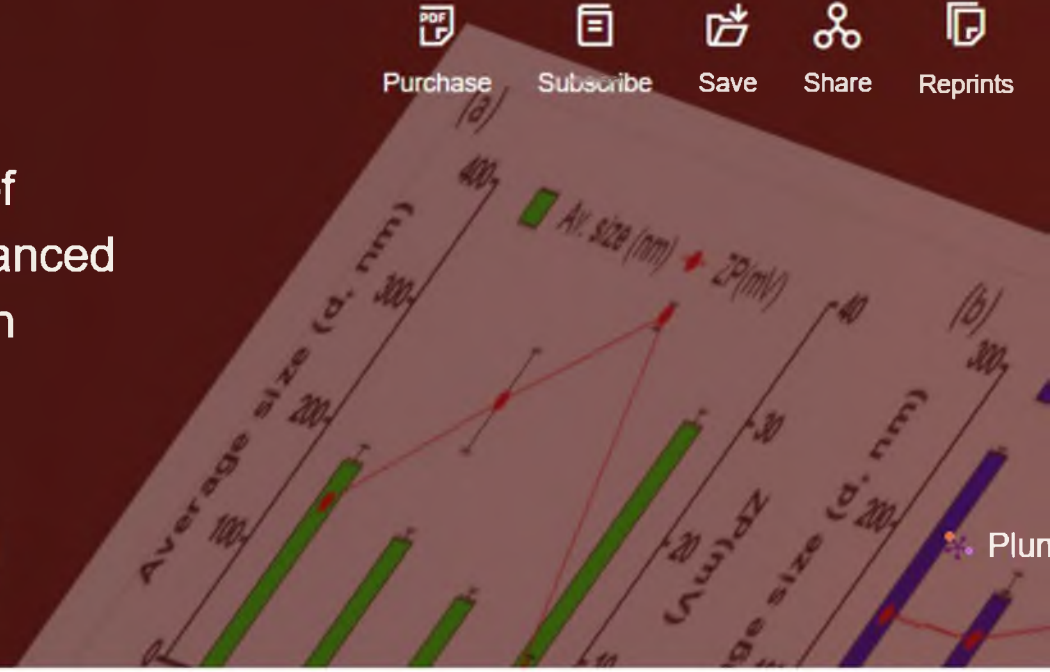
Journal of Pharmaceutical Sciences

PHARMACEUTICAL NANOTECHNOLOGY | VOLUME 110, ISSUE 8, P3047-3060, AUGUST 2021

Self-Assembled Biodegradable Core-Shell Nanocomposites of Amphiphilic Retinoic Acid-LMW bPEI Conjugates Exhibit Enhanced Transgene Expression in Hepatocellular Carcinoma Cells With Inherent Anticancer Properties

Zeba Ahmadi • Harekrushna Jena • Mahak Singh • Gagan Dhawan • Pradeep Kumar

Published: April 29, 2021 • DOI: https://doi.org/10.1016/j.xphs.2021.04.016 •



Abstract

Low molecular weight branched polyethylenimines (LMW bPEIs) are almost nontoxic but display poor transfection efficiency due to lack of adequate complexation ability with nucleic acids followed by transportation across the cell membrane. Here, a series of amphiphilic retinoyl-bPEI conjugates (RP-1, RP-2 and RP-3) has been synthesized by allowing the reaction between bPEI (1.8 kDa) and a bioactive and hydrophobic vitamin A metabolite, all-*trans*-retinoic acid (ATRA), in varying

ELSEVIER

Chinese Chemical Letters

Volume 32, Issue 11, November 2021, Pages 3342-3354

Review

Fluorine-containing pharmaceuticals approved by the FDA in 2020: Synthesis and biological activity

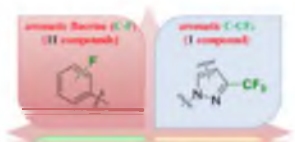
Yingjie Yu [a], Aiyao Liu [a], Gagan Dhawan [b], Haibo Mei [a], Wei Zhang [c], Kunisuke Izawa [d], Vadim A. Soloshonok [e f], Jianlin Han [a]

https://doi.org/10.1016/j.cclet.2021.05.042

Abstract

Thirteen new fluorine-containing drugs, which have been granted approval by the US Food and Drug Administration (FDA) in 2020, are profiled in this review. Therapeutic areas of these new fluorinated pharmaceuticals include medicines and diagnostic agents for Cushing's disease, neurofibromatosis, migraine, Alzheimer's disease, myelodysplastic syndromes, hereditary angioedema attacks, and various cancers. Molecules of these approved drugs feature aromatic fluorine (Ar-F) (11 compounds), aromatic Ar-CF_3 (1), aliphatic CHF (1) and CF_2 (1) groups. For each compound, we provide a spectrum of biological activity, medicinal chemistry discovery, and synthetic approaches.

Graphical abstract



Current Protein & Peptide Science

Editor-in-Chief »

ISSN (Print): 1389-2037
ISSN (Online): 1875-5550

Review Article

Peroxiredoxin-6: A Guardian of Lung Pathophysiologies

Author(s): Anju Kumari, Rimpy Kaur Chowhan, Pushpa Kakchingtabam, Sharifun Shahnaj, Hamidur Rahaman, Mohd Saquib Ansari and Laishram Rajendrakumar Singh*

Volume 22, Issue 9, 2021

Page: [666 - 674]

Pages: 9

DOI: 10.2174/1389203722666211109101853

Price: $65

Abstract

The moonlighting protein, Prdx-6, exhibits peroxidase activity, phospholipase activity, and lysophosphatidylcholine acyltransferase (LPCAT) activity. Although it is ubiquitous in expression, its level is prominently high in the lung. Prdx-6 has been known to be an important enzyme for the maintenance of normal lung physiologies including, anti-oxidant defense, lung surfactant homeostasis, and cell signaling. Studies further unveiled that the altered activity (peroxidase or ai- PLA2) of this enzyme is linked with various lung pathologies or diseases. In the present article, we attempted to address the various pathophysiologies or disease conditions (like lung ischemia, hyperoxia, lung cancer, emphysema, and acute lung injury) wherein Prdx-6 is involved. The study implicates that Prdx-6 could be used as a common drug target for multiple lung diseases. Important future insights have also been incorporated.

Keywords: Peroxiredoxin-6 , reactive oxygen species (ROS) , antioxidants , hyperoxia , acute lung injury , pulmonary microvascular endothelial

Review

Signaling mechanisms and biochemical pathways regulating pollen-stigma interaction, seed development and seedling growth in sunflower under salt stress

Satish C. Bhatla, Mansi Gogna, Prachi Jain, Neha Singh, Soumya Mukherjee & Geetika Kalra

Article: 1958129 | Received 23 Jun 2021, Accepted 15 Jul 2021, Published online: 25 Aug 2021

ABSTRACT

Sunflower (*Helianthus annuus* L.) is one of the major oilseed crops cultivated world over for its high-quality oil rich in linoleic acid. It also has established applications in pharmaceutical and biotechnological industries, mainly through recombinant production of unique oil body (OB) membrane proteins-oleosins, which are used for producing a wide variety of vaccines, food products, cosmetics and nutraceuticals. The present review provides a critical analysis of the progress made in advancing our knowledge in sunflower biology, ranging from mechanisms of pollen-stigma interaction, seed development, physiology of seed germination and seedling growth under salt stress, and finally understanding the signaling routes associated with various biochemical pathways regulating seedling growth. Role of nitric oxide (NO) triggered post-translational modifications (PTMs), discovered in the recent past, have paved way for future research directions leading to further understanding of sunflower developmental physiology. Novel protocols recently developed to monitor temporal and spatial distributions of various biochemicals involved in above-stated developmental events in sunflower, will go a long way for similar applications in plant biology in future.

Published: 08 March 2021

Unraveling the AM fungal community for understanding its ecosystem resilience to changed climate in agroecosystems

Dipanti Chourasiya, Manju M. Gupta, Sumit Sahni, Fritz Oehl, Richa Agnihotri, Reena Buade, Hemant S Maheshwari, Anil Prakash & Mahaveer P Sharma

Symbiosis **84**, 295–310 (2021) | Cite this article

994 Accesses | **13** Citations | **1** Altmetric | Metrics

Abstract

The changing global climate affects the agroecosystem making it challenging to achieve the world's sustainable development goals. Among the facets of belowground microbial communities, the arbuscular mycorrhizal fungi (AMF) hold an important place. They represent the most common symbiont phylum colonizing more than 80% of the plant families and are likely to be affected by global climate change. These fungi facilitate plant's mineral acquisition, improving growth and protecting them from biotic and abiotic stresses. The elevated carbon dioxide (eCO_2) level, temperature, increased nitrogen and phosphorus deposition influences the plant phenology and AMF functioning through changes in diversity and community composition of AMF. The interaction effects of soil management practices due to climate change affect the system productivity and perturb mineral cycling. Understanding the carbon and nitrogen cycling of an agro-ecosystem and its associated AMF communities concerning ecosystem productivity is the need of the hour. Plant-fungal associations require a

Issue 22, 2021

Previous Article | Next Article

From the journal:
Dalton Transactions

Al_2O_3/CuI/PANI nanocomposite catalyzed green synthesis of biologically active 2-substituted benzimidazole derivatives†

Check for updates

Sahil Kohli, [ab] Garima Rathee, [a] Sunita Hooda *[b] and Ramesh Chandra *[a]

Author affiliations

Abstract

This work is generally focused on the synthesis of an efficient, reusable and novel heterogeneous Al_2O_3/CuI/PANI nanocatalyst, which has been well synthesized by a simple self-assembly approach where aniline is oxidized into PANI and aniline in the presence of KI also acts as a reductant. The nanocatalyst was well characterized by XRD, FTIR, SEM, EDX, TEM, BET and XPS techniques. In this study, the fabricated material was employed for the catalytic one-pot synthesis of 2-substituted benzimidazoles *via* condensation between *o*-phenylenediamine and aldehydes in ethanol as a green solvent. The present method is facile and offers several advantages such as high % yield, less reaction time, and no use of additive/bases. Also, the catalyst showed better values of green metrics including low E-factor: 0.17, high reaction mass efficiency: 85.34%, high carbon efficiency: 94%, and high process mass intensity: 1.17.

Issue 22, 2021

Previous Article | Next Article

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Abstract

This work is generally focused on the synthesis of an efficient, reusable and novel heterogeneous Al_2O_3/CuI/PANI nanocatalyst, which has been well synthesized by a simple self-assembly approach where aniline is oxidized into PANI and aniline in the presence of KI also acts as a reductant. The nanocatalyst was well characterized by XRD, FTIR, SEM, EDX, TEM, BET and XPS techniques. In this study, the fabricated material was employed for the catalytic one-pot synthesis of 2-substituted benzimidazoles *via* condensation between *o*-phenylenediamine and aldehydes in ethanol as a green solvent. The present method is facile and offers several advantages such as high % yield, less reaction time, and no use of additive/bases. Also, the catalyst showed better values of green metrics including low E-factor: 0.17, high reaction mass efficiency: 85.34%, high carbon efficiency: 94%, and high process mass intensity: 1.17.

Multifunctional activity of graphene oxide-based nanoformulation against the disease vector, Aedes aegypti

PDF

Published Dec 16, 2021

DOI https://doi.org/10.31018/jans.v13i4.3018

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Abstract

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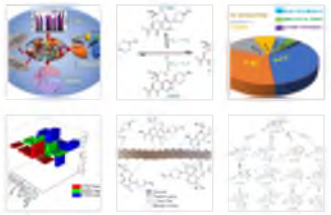

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Science of The Total Environment
Volume 813, 20 March 2022, 152529

Review

A comprehensive review on recent advances toward sequestration of levofloxacin antibiotic from wastewater

Laishram Saya [a b c], Vipin Malik [b], Drashya Gautam [b], Geetu Gambhir [b], Balendra [a], W. Rameshwor Singh [c], Sunita Hooda [b]

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Highlights

- Bioaccumulation of antibiotics like Levofloxacin in the environment is a cause of global concern.
- Maximum studies are carried out on adsorption and AOPs mainly photocatalytic degradation.
- Several photocatalysts exhibited up to 100% degradation of LEV making photocatalytic degradation the best method
- Biological degradation which may prove to be the most environment friendly is less reported for LEV removal.
- Hybrid techniques reserve a great scope of future research in the field.

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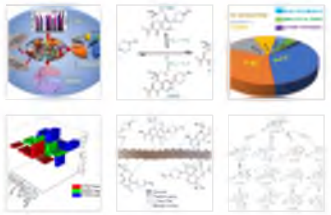

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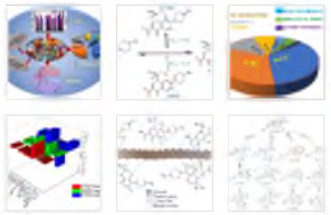

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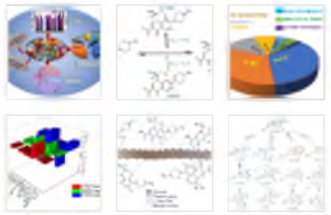

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Synthetic Communications ›
An International Journal for Rapid Communication of Synthetic Organic Chemistry
Volume 51, 2021 - Issue 19

Synthetic Communications Reviews

"In water" synthesis of bis(indolyl)methanes: a review

Leena Khanna, Mansi, Shilpa Yadav, Neeti Misra & Pankaj Khanna

Pages 2892-2923 | Received 29 May 2021, Published online: 30 Jul 2021

Abstract

Bis(indolyl) methane (BIM) derivatives have shown numerous biological properties which has influenced the scientific fraternity to explore the length and breadth of their synthesis. Mostly, the procedure involves a catalytic electrophilic substitution reaction of indoles with various aldehydes and ketones. However, many variations have been applied from time to time to promote this reaction under green conditions. The use of water as a solvent in organic synthesis, has gained much attention due to economic and eco-friendly reasons. It has also been observed that the reactions under aqueous conditions have shown high reactivities and chemo-selectivity, which are not found in organic media. "In water synthesis" of BIMs has gained considerable recent importance and several methods have been developed. Thus, in this review we have summarized different synthetic protocols used to prepare BIMs under aqueous conditions in the last fifteen years.

Keywords: Green protocols | aqua mediated | bis-indole | nanocatalyst | transition metal catalyst | acid catalysts

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Advanced Materials Letters

A DFT Study of Interaction of $(CdSe)_3$ Quantum Dots with Nucleobases

Document Type : Research Article

Authors
Pragati Malik Rita Kakkar

https://doi.org/10.5185/amlett.2021.081653

Abstract
Deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) play important roles in the storage of genetic information and protein biosynthesis. Nucleobases, which are nitrogenous bases, are the functional units of these nucleic acids. It is very important to detect changes in the sequence of DNA/RNA, as any mutations in them may cause harm to the organism. Our aim is to verify the use of $(CdSe)_3$ Quantum Dots (QDs), owing to their distinctive optical and electronic properties, for sensing changes in DNA/RNA. Hence, in this work, we have focused on studying the interaction between $(CdSe)_3$ QDs and the five nucleobases (adenine, guanine, cytosine, thymine and uracil) at various probable sites by means of density functional calculations. Several structural, electronic and optical properties, and charge transfer on interaction between the two, have been discussed. The present band gap and charge transfer calculations indicate that binding of $(CdSe)_3$ to guanine is strongest and is weakest with uracil. The vibrational spectral analysis indicates that the intensities of the peaks due to $(CdSe)_3$ enhance on interacting with the nucleobase, and a blue shift is observed in all the interactions. The presence of both the frontier orbitals (HOMO and LUMO) on the QD indicates that $(CdSe)_3$ acts as a guardian of DNA and prevents it from damage. Hence, our studies direct that CdSe QDs can be successfully employed as sensors for these nucleobases.

Keywords
Nucleobase purine pyrimidine quantum dots sensing HOMO LUMO

Volume 12, Issue 8
August 2021
Pages 1-11

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Research paper | Published: 02 February 2022

Size-dependent structural and electronic properties of stoichiometric II–VI quantum dots and gas sensing ability of CdSe quantum dots: a DFT study

Jyoti Singh, Rakhi Thareja, Pragati Malik & Rita Kakkar

Journal of Nanoparticle Research **24**, Article number: 33 (2022) | Cite this article

350 Accesses | **1** Citations | Metrics

Abstract

The structural, electronic, and quantum confinement effects observed in II–VI quantum dots have been described using density functional theory. Various properties like binding energy, Fermi energy, charge distribution, and band gap of various clusters have been determined as a function of cluster size in order to find out the most stable of all the clusters considered. The binding energies are found to be a function of the cluster size but converge to a maximum. Cadmium is observed to possess a larger tendency to form clusters with higher coordination numbers compared to zinc and mercury. In mercury sulfide $(HgS)_n$, the clusters with $n = 6$ and 13 get dissociated into two graphene-like parallel layers. The adsorptions of single gas molecules on the $(CdSe)_{13}$ quantum dots are exothermic, indicating that most of the gas molecules adsorb spontaneously on the CdSe quantum dots. Among the various gases, O_2 and NO_2 are the gas molecules that get most strongly chemisorbed. The CdSe quantum dot acts as an electron donor when it interacts with the oxidizing gases, O_2, CO, NO_2, and SO_2 gases. The vibrational analysis of the combined systems indicates that the intensities of the peaks due to

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Journal of Catalysis

Volume 401, September 2021, Pages 297-308

Surface engineered Iridium-based magnetic photocatalyst paving a path towards visible light driven C-H arylation and cyanation reaction

Pooja Rana [a], Rashmi Gaur [a], Bhawna Kaushik [a], Pooja Rana [a], Sneha Yadav [a], Priya Yadav [a], Priti Sharma [c], Manoj B. Gawande [b], Rakesh K. Sharma [a]

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https://doi.org/10.1016/j.jcat.2021.08.014

Abstract

The report presents the fabrication and application of a highly versatile, magnetic and robust iridium based photoredox nanocatalyst. Herein, $Ir(PPy)_3$ based photocatalyst sites have been chemically engineered over the magnetic nanoparticles to encompass the captivating features of homogeneous iridium photocatalyst with the magnetically recyclable core. A household photoreactor was designed and fabricated to achieve highly selective visible light driven oxidative C-H arylation and C-H cyanation under sustainable and ambient reaction conditions utilizing the Ir@PyBz@ASMNPs photoredox nanocatalyst. The environment friendly Ir@PyBz@ASMNPs shows excellent photocatalytic activity, broad substrate adaptability and outstanding recyclability compared to the analogous homogeneous catalysts. Indeed, the Ir@PyBz@ASMNPs possess some key features including high surface area, high iridium metal loading and excellent stability. This work is expected to enlighten and provide new insights in the rational design of high performance and recoverable photoredox nanocatalyst through surface engineering strategy.

Issue 19, 2021

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From the journal:
Materials Chemistry Frontiers

Unlocking the catalytic potency of a magnetic responsive $CoFe_2O_4$/Ni-BTC MOF composite for the sustainable synthesis of tri- and tetra-substituted imidazoles†

Sneha Yadav,[a] Ranjana Dixit,[a] Shivani Sharma,[a] Sriparna Dutta,[a] Bhavya Arora,[a] Pooja Rana,[a] Bhawna Kaushik,[a] Pooja Rana,[a] Alok Adholeya,[b] Manoj B. Gawande[c] and Rakesh K. Sharma *[a]

Author affiliations

Abstract

With the advancements in materials engineering, unprecedented newer materials based on magnetic MOFs have emerged as one of the promising candidates in the strategic field of catalysis. Within this perspective, the present report unveils the fabrication of an intricately designed magnetic $CoFe_2O_4$/Ni-BTC based MOF composite *via* a one-pot solvothermal approach. The synthesized composite was comprehensively characterized using various analytical tools

Supplementary files

Supplementary information
PDF (5433K)

Article | Open Access | Published: 24 December 2021

Enhanced catalysis through structurally modified hybrid 2-D boron nitride nanosheets comprising of complexed 2-hydroxy-4-methoxybenzophenone motif

Pooja Rana, Ranjana Dixit, Shivani Sharma, Sriparna Dutta, Sneha Yadav, Aditi Sharma, Bhawna Kaushik, Pooja Rana, Alok Adholeya ✉ & Rakesh K. Sharma ✉

Scientific Reports **11**, Article number: 24429 (2021) | Cite this article

Abstract

Tuning the structural architecture of the pristine two dimensional hexagonal boron nitride (*h*-BN) nanosheets through rational surface engineering have proven advantageous in the fabrication of competent catalytic materials. Inspired by the performance of *h*-BN based nanomaterials in expediting key organic transformations, we channelized our research efforts towards engineering the inherent surface properties of the exclusively stacked *h*-BN

Identifying Central Nodes in Directed and Weighted Networks

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University of Delhi, Delhi

***Abstract*—An issue of critical interest in complex network analysis is the identification of key players or important nodes. Centrality measures quantify the notion of importance and hence provide a mechanism to rank nodes within a network. Several centrality measures have been proposed for un-weighted, un-directed networks but applying or modifying them for networks in which edges are weighted and directed is challenging. Existing centrality measures for weighted, directed networks are by and large domain-specific. Depending upon the application, these measures prefer either the incoming or the outgoing links of a node to measure its importance. In this paper, we introduce a new centrality measure, *Affinity Centrality*, that leverages both weighted in-degrees as well as out-degrees of a node's local neighborhood. A tuning parameter permits the user to give preference to a node's neighbors in either incoming or outgoing direction. To evaluate the effectiveness of the proposed measure, we use three types of real-world networks - migration, trade, and animal social networks. Experimental results on these weighted, directed networks demonstrate that our centrality measure can rank nodes in consonance to the ground truth much better than the other established measures.**

***Keywords*—Centrality; weighted network; directed network; migration network; world input output trade network; community structure**

I. Introduction

Data analysts from diverse domains represent relationships online social networks [12], [25], detecting influential criminals [9], performing resilience analysis of power grid networks [13], locating key areas of activity in the urban infrastructure of a city [1], and traffic sampling for intrusion detection [28].

Several centrality measures have been formulated to quantify the notion of central nodes in un-weighted/ weighted, un-directed networks and are surveyed in [7], [3], [4], [5]. However, quantification of node centrality is more challenging in complex weighted and directed networks due to the dynamic effect of weighted reciprocal links on its computation. Very few measures exist for such networks, and the area remains under-explored.

A. The Problem and Motivation

PageRank (PR) proposed by Brin and Page to rank web pages is a popular and effective centrality measure [20], and there exist variations and extensions of PR for weighted, directed networks [27], [30]. These measures quantify the importance of a web page by iterative counting of the number and quality of its incoming links. The underlying assumption is that more important web pages have more *incoming* links from other central web pages. The problem is that this assumption, though correct for web pages, may not be valid for other domains. For example, in the migration networks, a state's

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Perception of youth on Digital India

Sunita Narang, Monica Singhania, Surinder Kaur and Shalu Mahajan

Published Online: July 8, 2021 · pp 365-388 · https://doi.org/10.1504/IJBIR.2021.116393

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Abstract

Digital India is seen as the engine for transition of India into an empowered nation. In this direction, several pro-people initiatives like MyGov, Digilocker, e-basta, and e-hospital are being implemented. Through a self-structured survey questionnaire, the study evaluates awareness about, implementation and utilisation of various e-services offered under the Digital India Program among Delhi University students. It examines the extent to which the services are being utilised and main barriers/challenges restricting its utilisation. The data has been analysed using ANOVA. The study reveals a high level of awareness among students. They believe it will improve the quality of services leading to good governance. Major factors restricting its implementation include lack of computer knowledge, fear of frauds and resistance to change. The study stressed on educating people about the benefits and usage of Digital India. The nation as a whole can move towards green and responsible governance by improving its acceptability.

Keywords

youth perception, Delhi University, Digilocker, e-basta, electronic basta, e-governance, electronic governance, Digital India Program, analysis of variance, ANOVA, e-learning, electronic learning, computer knowledge, good governance

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Published Online: July 08, 2021

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youth perception
Delhi University | Digilocker
e-basta | electronic basta
e-governance
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Abstract

Digital India is seen as the engine for transition of India into an empowered nation. In this direction, several pro-people initiatives like MyGov, Digilocker, e-basta, and e-hospital are being implemented. Through a self-structured survey questionnaire, the study evaluates awareness about, implementation and utilisation of various e-services offered under the Digital India Program among Delhi University students. It examines the extent to which the services are being utilised and main barriers/challenges restricting its utilisation. The data has been analysed using ANOVA. The study reveals a high level of awareness among students. They believe it will improve the quality of services leading to good governance. Major factors restricting its implementation include lack of computer knowledge, fear of frauds and resistance to change. The study stressed on educating people about the benefits and usage of Digital India. The nation as a whole can move towards green and responsible governance by improving its acceptability.

Keywords

youth perception, Delhi University, Digilocker, e-basta, electronic basta, e-governance, electronic governance, Digital India Program, analysis of variance, ANOVA, e-learning, electronic learning, computer knowledge, good governance

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Published Online: July 08, 2021

Keywords

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Delhi University | Digilocker
e-basta | electronic basta
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electronic governance

Research Article

International Journal of Advanced Technology and Engineering Exploration, Vol 8(83)
ISSN (Print): 2394-5443 ISSN (Online): 2394-7454
http://dx.doi.org/10.19101/IJATEE.2021.874417

Intensity quantification of public opinion and emotion analysis on climate change

Tishya Thukral[1], Ashwani Varshney[2] and Vibha Gaur[1*]
Department of Computer Science, Acharya Narendra Dev College, University of Delhi, India[1]
Department of Computer Science, University of Delhi, India[2]

Received: 13-July-2021; Revised: 09-October-2021; Accepted: 13-October-2021

Abstract

Human-related activities are primarily accountable for climate change resulting in natural disasters. Therefore, it has become essential to analyze and evaluate public awareness of climate change globally. With the prevalence of social networks like Twitter, sentiment classification has been recognized as a powerful tool to determine public opinion and concern on such ecological issues. Therefore, this study proposes a framework to classify the tweets containing public opinion towards climate change using Bi-directional Long Short-Term Memory (Bi-LSTM) Networks. The proposed framework quantified the intensity of the public opinion classified by the Bi-LSTM model to measure the strength of the public concern towards climate change and validated it using three case studies: Earth Day, Delhi Air Pollution, and Australian Bushfires. The intensity values of the public sentiments concerning these events were obtained as 98.50%, 96.57%, and 98.33%, respectively. The proposed work was further augmented with a lexicon-based emotion analyzer to categorize the emotions associated with the tweets into positive, negative, neutral, and mixed to substantiate the results. This framework can be utilized before enforcing the policy decisions on the general public in any domain.

Keywords

Bi-LSTM networks, Sentiment analysis, Global warming, Social networks, Climate change.

1.Introduction

The large-scale shift in the weather patterns due to intensified global warming is becoming a severe issue globally with constant evolving outlooks. Rising temperatures, melting of glaciers, and changes in weather patterns are some of the indicators of climate change. Increased human emissions on the Therefore, developing appropriate learning techniques to analyze and evaluate public awareness of the critical issues has become an absolute necessity for a promising future. For example, there have been instances of mass protests during the implementation of acts such as the Citizenship Amendment Act of (CAA) 2019 [4] and Farm Bills

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RESEARCH-ARTICLE

A smart learning assistance tool for inclusive education

Authors: Sangeeta Srivastava, Ashwani Varshney, Supriya Katyal, Ravneet Kaur, Vibha Gaur Authors Info & Claims

Journal of Intelligent & Fuzzy Systems: Applications in Engineering and Technology, Volume 40, Issue 6 • 2021 • pp 11981–11994 • https://doi.org/10.3233/JIFS-210075

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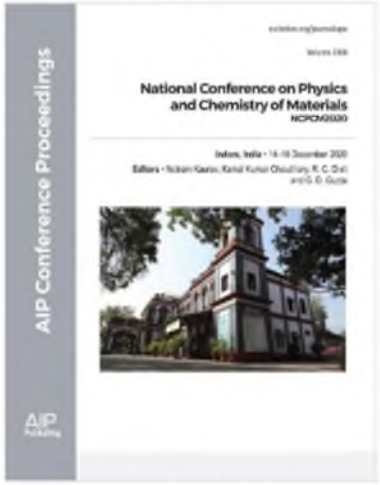

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Varying sonication conditions to tailor surface morphology of GO thin films for enhanced gas sensing performance

Vishal Dhingra; Shani Kumar; Arijit Chowdhuri; Amit Garg

+ Author & Article Information
AIP Conference Proceedings 2369, 020109 (2021)
https://doi.org/10.1063/5.0060996

Efficient and enhanced gas sensing especially at room temperature is the demand for contemporary industrial applications. This has been made possible due to a paradigm shift from semiconducting metal oxides to 2D materials including Graphene Oxide (GO) and reduced GO (RGO). GO and its derivatives have ushered in a revolution mainly because of their high surface to volume ratio and

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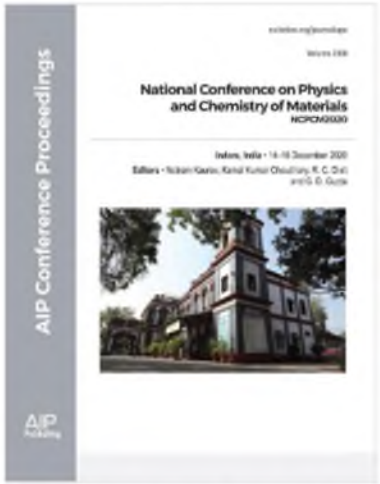

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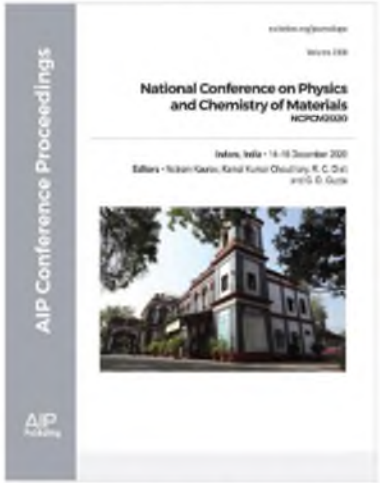

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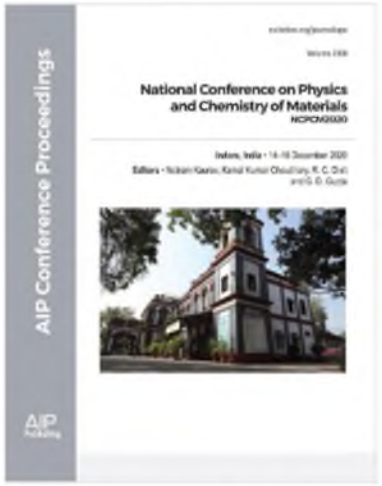

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Optimal ordering policy for deteriorating items with stock dependent demand, partial backlogging and trade credit period

Sachin Kumar Verma, Mohd. Rizwanullah and Chaman Singh

Published Online: September 6, 2021 · pp 95-120 · https://doi.org/10.1504/IJLSM.2021.117709

Abstract

In this paper, policies of optimal ordering has been focussed on economic order quantity (EOQ) model, where we considered deteriorated as well as non-instantaneous nature items. In this inventory model, we are also assuming there is a stock-dependent demand and constant holding cost. Occurrence of shortage during the complete process of the system, taking into consideration with partial backlogging where deterioration of items follows the Weibull distribution. In the present study, it is considered that the supplier's proposed lucrative trade credit offers to the retailers to buy more to generate more revenue. Numerical examples parallel to the present inventory model gives an optimal result. Lastly, sensitivity analysis applied to different parameters and graphical representations have shown to validate the model.

Keywords

stock dependent demand pattern, partial backlogging, constant holding cost, trade credit, Weibull deterioration

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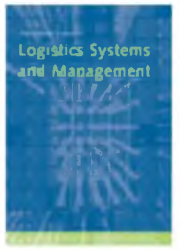

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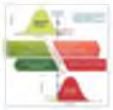
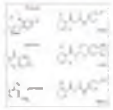

Tables (1)

Table 1

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Manu Sankar, Sarita Kumar

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Abstract

Mosquitoes serve as the major vector transmitting malaria, dengue, yellow fever and several other diseases of human concern. Rising in mosquito-borne diseases and consequent fatalities throughout the world has made the management of mosquitoes of paramount importance. With the use of various insecticidal agents and their indiscriminate application in the fields for vector control; other issues such as multiple insecticide resistance, lethality to non-specific targets and adverse effects on human and environmental health have emerged making the situation more critical. Hence, the focus of researchers has diverted to the use of Insect Growth Regulators (IGRs) that affect the growth and development of the insects without inducing any appreciable toxic effects. The paper comprehensively reviews various IGRs and their potential use against insect pests and mosquito vectors. A special emphasis has been laid on the utilization of diflubenzuron, its larvicidal potency and growth regulatory effects against mosquitoes. The paper also delivers a detailed discussion on various approaches governing with the application of diflubenzuron. a chitin synthesis inhibitor, for its potent effects over a wide range of other insect species, low toxicity to humans, safety to other non-target animals, negligible deleterious environmental impact along with the possible

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Indigenous Plants Demonstrating Effective Antioxidant Properties

Karmanyaraj Singh Yadav, Roopa Rani Samal, Arunima Sahgal & Sarita Kumar

Biology Bulletin **48**, S62–S72 (2021) | Cite this article

Abstract

Increased production of antioxidant herbal supplements utilizing traditional medicinal plants has been attributed to a high margin of economic effectiveness, environmental friendliness, and accessibility. Current investigations determined the antioxidant properties of leaf and stem extracts of five plants, *Oxalis corniculata*, *Argemone mexicana*, *Thevetia neriifolia*, *Acacia karoo* and *Cassia fistula* using DPPH radical scavenging activity, Xanthine oxidase (XO) inhibition and Superoxide scavenging activity. Based on the individual extract activity, different binary formulations were prepared and assayed for their antioxidant properties to identify the most promising combination. The *A. mexicana* and *A. karoo* leaf extracts showed maximum DPPH activity while highest XO inhibition was induced by *A. mexicana* leaf extract (IC_{50} = 6.849 ± 1.502 µg/mL) followed by the *T. neriifolia* stem extract (IC_{50} = 10.366 ± 0.1.322 µg/mL). Superoxide (SO) scavenging effect of all the extracts was significantly higher in comparison to the control. The combinations of *A. mexicana* and *A. karoo* leaf extracts in 2 : 1 and 3 : 1 ratios; and that of *C. fistula* and *A. karoo* stem extracts exhibited synergistic antioxidant effects in comparison to the individual extracts. The antioxidant activity increased

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Journal of Communicable Diseases (E-ISSN: 2581-351X & P-ISSN: 0019-5138)

Formulation of Clitoria ternatea Leaves-mediated Silver Nanoparticles to Control Aedes aegypti Larvae

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Department of Zoology, Acharya Narendra Dev College, University of Delhi, Kalkaji, New Delhi, India.

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Keywords: Larvicide, Nanocomposites, Clitoria ternatea, Aedes aegypti, DLS, SEM, TEM

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Vol. 53 No. 3 (2021): Journal of Communicable Diseases

Section
Research Article

Original Article | Published: 07 May 2021

In vitro and in silico anticancer potential analysis of *Streptomyces* sp. extract against human lung cancer cell line, A549

Prateek Kumar, Anjali Chauhan, Munendra Kumar, Bijoy K. Kuanr, Aditi Kundu, Renu Solanki & Monisha Khanna Kapur

3 Biotech **11**, Article number: 254 (2021) | Cite this article

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Abstract

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SIGHTINGS OF THE TAILLESS LINEBLUE *PROSOTAS DUBIOSA* (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN DELHI, INDIA

RAJESH CHAUDHARY[1] AND CHANDRA BHUSAN MAURYA[2]

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Reviewer: Piet van der Poel

The floristic composition of Delhi has changed significantly during past one and half centuries (Maheshwari, 1963; Anonymous, 1991). Several non-native plant species have been introduced for afforestation and beautification of gardens and parks (Maheshwari, 1963). In addition, the city has also witnessed an increased plantation of vegetable and fruit plants (Maheshwari, 1963). Factors such as change in floristic characteristics, appearance of new microhabitats, change in land use and climate change, alone or in combination can cause an alteration to the butterflies species diversity in a geographical area (Kwon *et al.*, 2021; Mukherjee *et al.*, 2019).For instance, in Delhi, a few species of butterflies,such as Common Jay (*Graphium doson* C. & R. Felder, 1864), Red Pierrot (*Talicada nyseus* Guérin-Méneville, 1843) and Plains Cupid (*Chilades pandava* Horsfield, 1829),that are fairly common at present, werenot recordedby previous workers (Donahue, 1967; Larsen,2002). These butterfly species are thought to have been introduced in Delhi duringthe last two decades along with their host plants, which have ornamental value. Also, species which were once considered extremely rare in Delhi such as the Common Lineblue (*Prosotas nora* C. Felder, 1860) and 2019; 2020).Besides these, there is a recent record of the Common Grass Dart (*Taractrocera maevius*) (Madan & Dey, 2018) that had not been reported previously from Delhi.In the present communication, we report sightings of the Tailless Lineblue (*Prosotas dubiosa*) from various parts of Delhi and its vicinity.

Two individuals of the Tailless Lineblue were sighted in the Sanjay Van area (28° 31′ 48″N, 77° 10′ 15″E) of South Delhi during thelate morning on2.x.2021 (Figure 1).Both the individuals were found puddling together on a footpath. These were observed for about 10 minutes and photographed. Another individual of this species was sighted and photographed on the morning of 13.x.2021, basking on a tree inthe R. K. Puram area (28° 33′ 20″N, 77° 10′ 49″E) of New Delhi. It is noteworthy that this butterfly species was also sighted by us on 14.x. and 16.x.2021 (two individuals each day) in Aravalli Biodiversity Park, Gurugram, Haryana (28° 28′ 56″N, 77° 06′ 39″E).Therefore, it islikely that the Tailless Lineblue is present in other parts of Delhi-NCR as well.

To the best of our knowledge, the Tailless Lineblue has not been reported previously from Delhi (Donahue, 1967; Larsen, 2002) or

SIGHTING OF PLAIN TIGER (*DANAUS CHRYSIPPUS* LINN., 1758) FORM *DORIPPUS* IN NEW DELHI, INDIA

RAJESH CHAUDHARY
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Reviewer: Peter Smetacek

Four forms of *Danaus chrysippus* are known from India, viz. *chrysippus, alcippoides, amplifascia* and *dorippus* (Smetacek, 2001). The first form is the most common in the country whereas sighting of the other three forms are rare (Smetacek, 2001). The form *dorippus*, known to be a common form in Africa, is sighted only rarely in India (Smith *et al*., 1997; Smetacek, 2001). This form is

References

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M. Yuvaraj & P. Smetacek. 2019. First report of *Danaus chrysippus* form *dorippus* (Insecta: Lepidoptera: Nymphalidae) from Andhra Pradesh, India. *Bionotes* 21(3): 65-

GENERA OF ANTS ASSOCIATED WITH LARVAE OF PLAINS CUPID (*CHILADES PANDAVA*, HORSFIELD, 1829) (INSECTA: LEPIDOPTERA: LYCAENIDAE) INFESTING *CYCAS*, IN DELHI, INDIA, AND AN INSIGHT INTO THE NATURE OF THEIR INTERACTION

RAJESH CHAUDHARY[1] AND VINESH KUMAR[2]

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*[*1] rajeshchaudhary@andc.du.ac.in*

Reviewer: Peter Smetacek

Abstract

Larvae of many species of Lycaenid butterflies are known to associate with ants. With respect to larvae, the association can be facultative or obligatory. Also, larvae of some species of Lycaenids maintain a parasitic, and many others a mutualistic relationship with ants. Larvae of *Chilades pandava* (Lepidoptera:Lycaenid:Polyommatini) -a butterfly that has recently extended its range along with the artificial introduction of its larval host plants, several species of *Cycas*, is known to associate with more than one genera/species of ants. We sampled ornamental *Cycas* plants in urban Delhi infested with *C. pandava* for the genera of ants that associate with the larvae of this butterfly. Results compiled from sampling studies in Delhi, and various reports from literature indicated that at least 13 genera of ants can associate with larvae of *C. pandava*. In the present communication, these results have been discussed in light of the nature of association between *C. pandava* and ants.

Keywords Lycaenid-ant Association, Mutualism

Introduction

The larvae of many Lycaenid butterflies are known to associate with ants- 'myrmecophily' (Pierce *et al*., 2002). The relationship between larvae and ants can be parasitic, commensal or mutualistic (Baylis *et al*., 1993; Fiedler, 2012). The latter type of relationship i.e. mutualism, occurs most frequently (Fiedler, 2006a; 2012). In mutualism, the butterfly larvae provide nutritious secretion-'larval nectar' (rich in sugars and amino acids) from Dorsal Nectary Organs (DNO, located in 7th abdominal segment of larvae) to ants. In return, the larvae are exempted from attack by ants and additionally, ants aggressively safeguard segment which are known to secrete volatile substances, and Pore Cupola Organs (PCO) distributed on abdomen (Pierce *et al*., 2002; Ekka *et al*., 2020). The function of substances secreted from TO is similar to the ant alarm pheromone; it alerts ants when larvae are alarmed, and can communicate the message of need for protection to several species of ants (Pierce *et al*., 2002; Ekka *et al*., 2020). Gnatzy *et al*. (2017) suggested that TO are mechanosensors. PCO is known to secrete substances to appease ants which otherwise may attack soft bodied larvae. Thus, the three organs, i.e. DNO, TO and PCO are important

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REVIEW ARTICLE

COVID-19 and Cardiovascular Disease

Clinical Implications of Biochemical Pathways

Varmani, Shivani G[1,#]; Chowhan, Rimpy Kaur[2,#]; Sharma, Ishani[3]; Narang, Rajiv[4]

Author Information

Journal of the Practice of Cardiovascular Sciences 7(2):p 97-107, May–Aug 2021. | **DOI:** 10.4103/jpcs.jpcs_21_21

OPEN

Abstract

Coronavirus disease of 2019 (COVID-19) is a viral pandemic which has taken away more than over 4 million lives all over the world as of July 9, 2021, with the USA, India, and Brazil being the most affected

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Special issue No. 5 (August 2019)
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(R1513) The Dynamical Study of Variable Mass Test Particle in Nonlinear Sense of Restricted 3-body Problem with Heterogeneous Primaries

Sada Nand Prasad, *Acharya Narendra Dev College, University of Delhi*
Kumari Shalini, *Zakir Hussain Delhi College, University of Delhi*
Abdullah A. Ansari, *International Center for Advanced Interdisciplinary Research (ICAIR)*

Abstract

The main idea of this paper is to study the non-linear stability property of the motion of the test particle which is moving under the influence of heterogeneous primaries having *N*-layers with different densities as well as varying its mass according to Jeans law. The system is also perturbed by the small perturbations in Coriolis as well as centrifugal forces. We evaluate the equations of motion of the test particle under the influence of the above said perturbations. From this system of equations of motion, we reveal analytically the locations of stationary points as well as the non-linear stability.

Development of Dimethylisoxazole-Attached Imidazo[1,2-*a*]pyridines as Potent and Selective CBP/P300 Inhibitors

Alex Muthengi, Virangika K. Wimalasena, Hailemichael O. Yosief, Melissa J. Bikowitz, Logan H. Sigua, Tingjian Wang, Deyao Li, Zied Gaieb, Gagan Dhawan, Shuai Liu, Jon Erickson, Rommie E. Amaro, Ernst Schönbrunn*, Jun Qi*, and Wei Zhang*

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Publication Date: April 19, 2021
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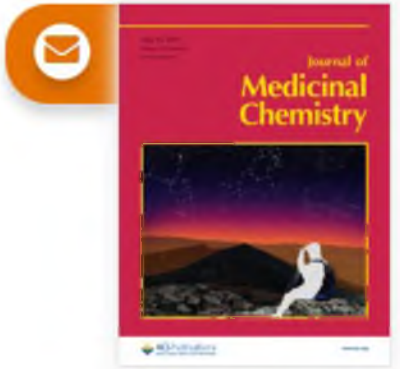
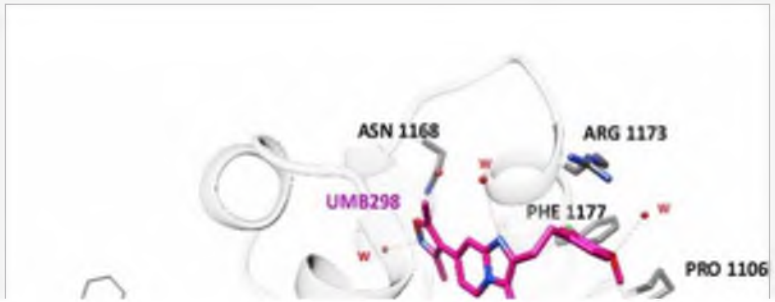


Journal of Medicinal Chemistry

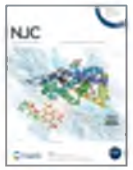
SUBJECTS: Assays, Inhibition, Inhibitors,

Abstract

The use of epigenetic bromodomain inhibitors as anticancer therapeutics has transitioned from targeting bromodomain extraterminal domain (BET) proteins into targeting non-BET bromodomains. The two most relevant non-BET bromodomain oncology targets are cyclic AMP response element-binding protein (CBP) and E1A binding protein P300 (EP300). To explore the growing CBP/EP300 interest, we developed a highly efficient two-step synthetic route for dimethylisoxazole-attached imidazo[1,2-*a*]pyridine scaffold-containing inhibitors. Our efficient two-



Issue 3, 2021



From the journal:
New Journal of Chemistry

Ex vivo binding studies of the anti-cancer drug noscapine with human hemoglobin: a spectroscopic and molecular docking study†

Heerak Chugh,[a] Pramod Kumar,[b] Neeraj Kumar,[a] Rajesh K. Gaur,[c] Gagan Dhawan[d] and Ramesh Chandra[*a]

Author affiliations

Abstract

Noscapine is a non-narcotic alkaloid known to display anti-cancer activity against a wide variety of tumors. Since plasma proteins play the central role in drug transport and targeting, herein we study the binding of noscapine hydrochloride (Nos) with human hemoglobin (Hb), a naturally encapsulated transport molecule. The molecular and biophysical basis of Nos–Hb binding has been investigated by using UV-vis, fluorescence spectroscopy, circular dichroism (CD) and computational methods. The Benesi–Hildebrand binding constant (K_b) and Stern–Volmer constant (K_{SV}) were determined to be 150 M^{-1} and 5.31 × 10^3 M^{-1}, respectively. The biomolecular-quenching constant (K_q), 1.06 × 10^{12} M^{-1} s^{-1}, indicated a rather static quenching mechanism and negative value for free energy (ΔG −12.5 kJ M^{-1}) which

Supplementary files

Supplementary information
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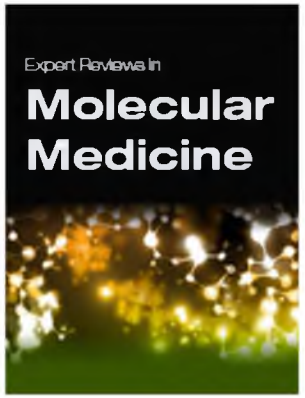

Expert Reviews in Molecular Medicine

Article contents

Targeting unfolded protein response: a new horizon for disease control

Published online by Cambridge University Press: **04 March 2021**

Madhu Khanna, Nishtha Agrawal, Ramesh Chandra and Gagan Dhawan

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Abstract

Unfolded protein response (UPR) is an evolutionarily conserved pathway triggered during perturbation of endoplasmic reticulum (ER) homeostasis in response to the accumulation of unfolded/misfolded proteins under various stress conditions like viral infection, diseased states etc. It is an adaptive signalling cascade with the main purpose of relieving the stress from the ER, which may otherwise lead to the initiation of cell death via apoptosis. ER stress if prolonged,

Research Journal of Educational Sciences

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Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices

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Res. J.Educational Sci., **Volume 9, Issue (1),** Pages 1-8, August,1 **(2021)**

Abstract

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Abstract

Worldwide Ambient Air Pollution (AAP) has been identified as a major hazard to all living beings covering the entire gamut from cities enveloped in smog to non-discernible polluted air inside homes and that are known to bring a negative influence on health and climate. World Health Organization (WHO) in its global report of 2019 attributed 7 million deaths to Air Pollution, both household (HAP) and AAP. In the scathing report while 3.8 million deaths were ascribed to inefficient fuel burning and dirty cook

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Inclusion of environmental awareness as basic tenet of education in India for realization of sustainable practices

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Res. J.Educational Sci., **Volume 9, Issue (1),** Pages 1-8, August,1 **(2021)**

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Pressure Ionization, Polarizability and Screening Constants in Confined Hydrogen Like Ions of Astrophysical Importance

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Volume 34, Part 3, 2021, Pages 767-770

Encompassing environment synthesis, characterization and photovoltaic utilization of cadmium sulphide quantum dots

Rahul [a b], Shruti Singh [c], Pramod K. Singh [b], Jitender Paul Sharma [e], Sunanda Kakroo [b], Rakesh Sonker [d], Zishan H. Khan [a]

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Abstract

Semiconductor QDs has been intensively studied to their interesting characteristics both from the views of fundamental research and practical applications. Colloidal quantum dots are grown in solution from precursors. In comparison amongst the quantum dots (QDs) available in the literature, cadmium supplied quantum dots (CdS QDs) are more popular because of their high luminescence, good quantum yield, wide band gap. The most popular method of preparation is hot organometallic precursor route. In this paper, very low cost and efficient CdS-QD has been synthesized using chemical bath method. The prepared CdS QDs are characterized by UV–Vis absorption, photoluminescence (PL), XRD. A quantum dot sensitized solar cell (QDSSC) will be proposed using a synthesized

International Journal of Computer Science Trends and Technology (IJCST) – Volume 9 Issue 5, Sep-Oct 2021

RESEARCH ARTICLE OPEN ACCESS

Reliable Time Slot Allocation Scheme among Mobile Nodes in MANET

Chandra Kanta Samal

Deptt. Computer Science. ANDC, Delhi University,
New Delhi - India

ABSTRACT
The broadcast protocol in MANET is less efficient and cannot guarantee collision free broadcasts due to high mobility of nodes. This article purposes a new slot allocation scheme between mobile nodes to control, collision; it requires 1-hop neighbour information and also the two-hop neighbor's coverage. Each node maintains a local topology of its 2-hop neighbourhood, and only a small subset of 1-hop neighbours forwards this message, which can reduce the possibility of collision, decrease the delay of the broadcast, and improve the throughput of the network. The subset of 1-hop neighbours selected should cover all the 2-hop nodes and it reduces the broadcast storm problem. Simulation results show that reliable time slot allocation among mobile node algorithm is efficient and reachability within the transmission range of the network. It is a collision free, reliable time slot allocation scheme among nodes and minimum time slot forward broadcast up to 2-hop nodes.

Keywords: Broadcast Storm Problem, Slot Allocation, Throughput, Topology, Reachability.

I. INTRODUCTION

In broadcasting, one node sends a packet to any or all other nodes within the network. Efficient broadcasting during a mobile unintended network focuses on selecting a small forward node set while ensuring broadcast coverage. Due to high mobility and dynamism in mobile ad hoc network, a collision occurs. Within the multi - hop environment, mobile nodes depend to each other's when they are transmitted. It is a distributed network, nodes frequent connectivity changes, due to mobility of nodes and high demand for channel access protocols. Mobile node's transmission on broadcast using omnidirectional antennas, then broadcast service available in mobile ad hoc network. The initial slot assignments between mobile nodes to make a frame schedule on that time collision occur, when new link detects for joining or removes the network in that case again the initial slot assignments. Many transmission scheduling protocols are proposed to improve the channel efficiency [3]. This research paper, we propose the Reliable Time Slot Allocation Among Mobile Nodes (RTSAAMN) algorithm using in Mobile Ad hoc Network. This algorithm involves a minimum time slot; it reduces collisions on the network and their network bandwidths of channels

Received: 5 November 2021 | Accepted: 5 March 2022

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RESEARCH ARTICLE

JOURNAL OF MEDICAL VIROLOGY WILEY

Adverse events and breakthrough infections associated with COVID-19 vaccination in the Indian population

Geetika Arora[1] | Jyoti Taneja[2] | Priya Bhardwaj[3] | Shorya Goyal[4] | Kumar Naidu[5] | Sunita. K. Yadav[2] | Daman Saluja[1] | Sunita Jetly[4]

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Sunita Jetly, Department of Biomedical Sciences, Acharya Narendra Dev College, University of Delhi, New Delhi 110019, India.
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Abstract

Vaccines against COVID-19 provide immunity to deter severe morbidities associated with the infection. However, it does not prevent infection altogether in all exposed individuals. Furthermore, emerging variants of SARS-CoV-2 impose a threat concerning the competency of the vaccines in combating the infection. This study aims to determine the variability in adverse events and the extent of breakthrough infections in the Indian population. A retrospective study was conducted using a pre-validated questionnaire encompassing social, demographic, general health, the status of SARS-CoV-2 infection, vaccination, associated adverse events, and breakthrough infections in the Indian population. Informed consent and ethical approval were obtained as per Indian Council of Medical Research (ICMR) guidelines. Participants, who provided the complete information, were Indian citizens, above 18 years, and if vaccinated, administered with either Covishield or Covaxin, were considered for the study. Data have been compiled in Microsoft Excel and analyzed for statistical differences using STATA 11. The responses from 2051 individuals fulfilling the inclusion criteria were analyzed. Among 2051, 1119 respondents were vaccinated and 932 respondents were non-vaccinated. Among 1119 vaccinated respondents, 7 were excluded because of missing data. Therefore, out of 1112 vaccinated, 413 experienced adverse events with a major fraction of younger individuals, age 18–40 years, getting affected (74.82%; 309/413). Furthermore, considerably more females than males encountered adverse consequences to vaccination ($p < 0.05$). Among vaccinated participants, breakthrough infections were observed in 7.91% (88/1112; 57.96% males and 42.04% females) with the older age group, 61 years and above (odds ratio, 3.25 [1.32–8.03]; $p = 0.011$), and males were found to be at higher risk. Further research is needed to find the age and sex-related factors in determining vaccine effectiveness and adverse events.

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Abstract

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J. Integr. Sci. Technol. 2022, 10(2), 61-66 Article

Journal of Integrated
SCIENCE & TECHNOLOGY

Association of Gender, Age, and Comorbidities with COVID-19 infection in India

Sunita Kumari Yadav,[1] Priya Bhardwaj,[2] Praveen Gupta,[3] Daman Saluja,[4] Sunita Jetly,[5] Jyoti Taneja[1*]

[1]Zoology Department, Daulat Ram College, University of Delhi, Delhi-110007, India. [2]Department of Zoology, University of Delhi, Delhi-110007, India. [3]Department of Neurology, Fortis Memorial Research Institute, Gurugram, Haryana-122022, India. [4]Medical Biotechnology Laboratory, Dr. B.R. Ambedkar Center for Biomedical Research, and Delhi School of Public Health, IoE, University of Delhi, Delhi-110007, India. [5]Department of Biomedical Sciences, Acharya Narendra Dev College, University of Delhi, Delhi-110019, India.

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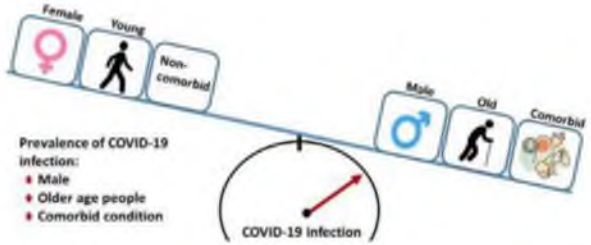
ABSTRACT



Due to a lack of data on various parameters with COVID-19 in the Indian population, this study was carried out to understand the relation among gender, age and comorbidities in Indian population. The data was collected using a questionnaire-based survey form that included questions on demographic characteristics, infection and any pre-underlying conditions (n=1146). The data showed that the male patients had suffered more from COVID-19 (58.6%). Also, the patients suffering from comorbidity are more likely to suffer from a severe form of COVID-19 and obesity/overweight was identified as the most prevalent (n=69) comorbid condition, followed by diabetes (n=35), thyroid (n=19) and hypertension (n=11). In severe COVID-19 cases, 85% of patients had a comorbid condition. In another study of COVID-19 hospitalized-cases, about 97% of patients were found to have an underlying medical condition. Among these, diabetes (55.9%) was identified as the most prevalent comorbidity. Males and older people are at a higher risk of developing COVID-19 infection in Indian population. The comorbid conditions also predisposed individuals to COVID-19 and aggravated the infection.

Keywords: COVID-19, comorbidity, age, gender, obesity, diabetes, hypertension

INTRODUCTION

15 December 2021, it has affected about 270 M people worldwide, including 34.2 M cases from India.[1] Due to its heterogeneity, the

Hesitancy and Acceptance of COVID-19 Vaccination Amidst the Second Wave of Pandemic in India: A General Population Study

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2022, Vol. 34(4) 446–449

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Sunita Jetly, PhD[1]*, Priya Bhardwaj, PhD[2]*, Geetika Arora, MSc[3], Daman Saluja, PhD[4], Sunita K. Yadav, PhD[5], Kumar P. Naidu, MSc[6], and Jyoti Taneja, PhD[5]

Introduction

Currently, with Delta, Omicron, and other variants on a rampage across the world, it is imperative to get vaccinated in time to curtail the burden of COVID-19 pandemic. The SARS-CoV-2 pandemic was devastating in India, infecting more than 34 million people and 4 million mortality as on December 22, 2021.[1] India is the second densest country with a population of more than 1.3 billion posing a challenge for COVID-19 vaccination.[2] In order to accelerate the pace of vaccination, the Government of India adopted an aggressive "Covid-19 Vaccine Communication Strategy" with the key elements being advocacy, capacity building, media, and social media engagement, social mobilization, community

Results

Demographic Profile of Respondents

A total of 2051 Indians participated in the online and offline surveys with a higher representation of respondents aged 18 to 40 years (70.9%), 41 to 60 years (23.8%), and 61 years and above (5.3%). Gender was found to be almost equally distributed among respondents. About 37.7% were academicians followed by professional and managerial occupations (32.3%) and frontline workers (15.7%). Of note, about 37.1% of the study participants had experienced COVID-19.

Basic Characteristics of Vaccine Hesitancy (VH)

Bioorganic & Medicinal Chemistry
Volume 69, 1 September 2022, 116886

Bioreducible polyethylenimine core–shell nanostructures as efficient and non-toxic gene and drug delivery vectors

H. Jena [a b], Z. Ahmadi [b c], P. Kumar [b], G. Dhawan [a d]

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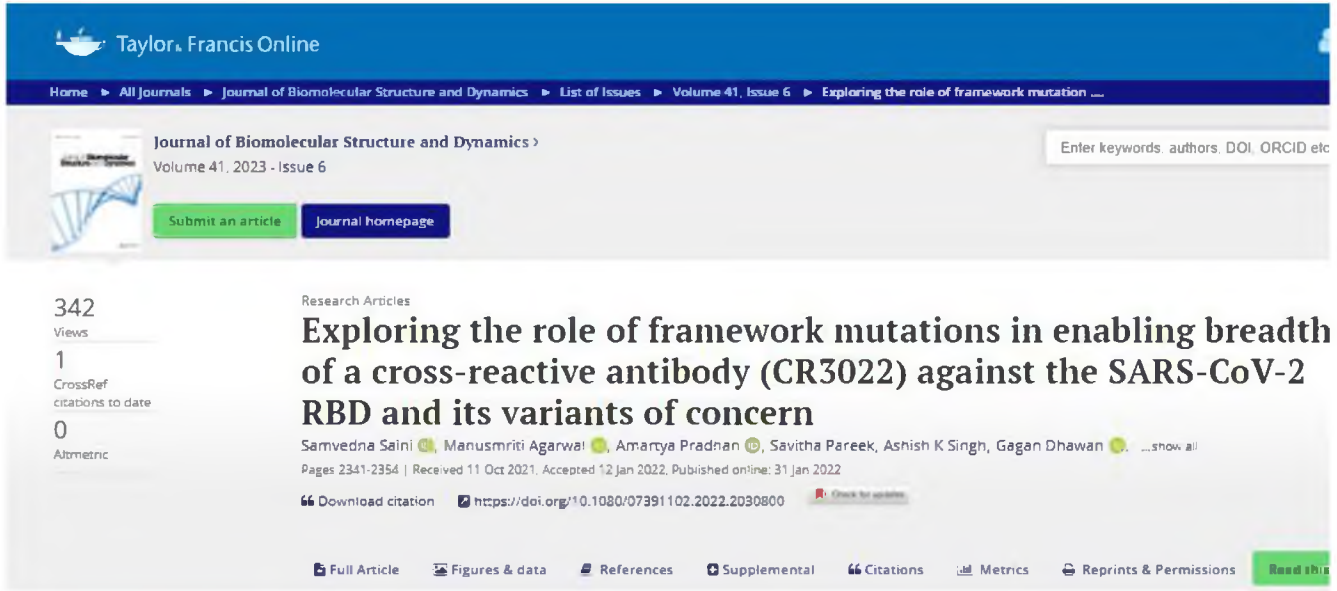
Abstract

Low molecular weight branched polyethylenimine (LMW bPEIs 1.8kDa) have received considerable attention for the fabrication of nucleic acid carriers due to their biocompatible and non-toxic nature. However, due to the inadequate nucleic acid complexation ability and transportation across the cell membrane, these show poor transfection efficacy, limiting their clinical applications. Therefore, to overcome these challenges, in this study, we have grafted bPEI 1.8kDa with a disulfide bond containing hydrophobic moiety, 3-(2-pyridyldithio) propionic acid (PDPA), via amide linkages through EDC/NHS-mediated coupling to obtain N-[3-(2-pyridyldithio)] propionoyl polyethylenimine (PDPP) conjugates. The best formulation for nucleic acid transfection was evaluated after preparing a series of PDPP conjugates by varying the amount of PDPA. In an aqueous environment, these PDPP conjugates self-assembled to form spherical shaped core–shell PDPP nanostructures with size ranging from ~188–307 nm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Abstract
Cross-reactive and broadly neutralizing antibodies against surface proteins of diverse strains of rapidly evolving viral pathogens like SARS-CoV-2 can prevent infection and therefore are crucial for the development of effective universal vaccines. While antibodies typically incorporate mutations in their complementarity determining regions during affinity maturation, mutations in the framework regions have been reported as players in determining properties of broadly neutralizing antibodies against HIV and the Influenza virus. We propose an increase in the cross-reactive potential of CR3022 against the emerging SARS- CoV-2 variants of concern through enhanced conformational flexibility. In this study, we use molecular dynamics simulations, *in silico* mutagenesis, structural modeling, and docking to explore the role of light chain FWR mutations in CR3022, a SARS-CoV anti-spike (S)-protein antibody cross-reactive to the S-protein receptor binding domain of SARS-CoV-2. Our study shows that single substitutions in the light chain framework region of CR3022 with conserved epitopes across SARS-CoV strains allow targeting of diverse antibody epitope footprints that align with the epitopes of recently-categorized neutralizing antibody classes while enabling binding to more than one strain of SARS-CoV-2. Our study has implications for rapid and evolution-based engineering of broadly neutralizing antibodies and reaffirms the role of framework mutations in effective change of antibody
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Review on adsorptive removal of metal ions and dyes from wastewater using tamarind-based bio-composites

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Abstract

Large-scale industrialization and urbanization have led to such an alarming level of water contamination throughout the world that wastewater management has become one of the major global challenges attracting much research attention in recent times. Various techniques have been adopted for the treatment of polluted water among which adsorption has been preferred on a larger scale by virtue of its ease and cost-effective nature. This review highlights the efficiency of tamarind-based nanocomposites as potential adsorbents for a varying range of harmful organic and inorganic water pollutants including metal ions, fluoride ions and numerous kinds of dyes. A comprehensive analysis of fabrication routes, adsorption isotherms, kinetic and thermodynamic modeling as well as the adsorption mechanism and recyclability of these adsorbents is being presented in this work. In addition, various factors affecting the adsorption behavior such as pH, amount of adsorbent, concentration of ion/dye and influence of contact time are being elaborately outlined. The comparison of different composites on the basis of their effectiveness, selectivity, economic and environmental aspects has also been outlined. Moreover, a brief comparison of tamarind-based nanocomposites with

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ASIAN JOURNAL OF CHEMISTRY

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Keywords: Methyl methacrylate, Terpolymer, Sensor, Cadmium(II), Ion selective electrode, Membrane.

INTRODUCTION

In recent times, there has been an unwanted accumulation of heavy metal ions in the environment due to their utilization on a wide scale in various activities such as agricultural, technological and industrial applications, *etc*. This has posed a serious threat to the eco-system, particularly human beings [1,2]. Amongst all heavy metals, cadmium is attracting much concerning attention as it is one of the most toxic metals associated with serious health effects. Cadmium is present in its inorganic form in phosphate rocks. However, huge amount of cadmium is introduced into the environment due to widespread use of phosphate fertilizers as well as from the waste effluents of industries like electroplating, smelting, alloy manufacturing, pigments, plastic, battery, mining and refining processes [3-5]. Chronic exposure to cadmium can cause adverse health problems such as destruction of the red blood cells, high blood pressure, damage to kidney, lungs and liver, *etc*. [6,7]. Cadmium is also known to cause severe joint and spine pain due to osteomalacia, osteoporosis and itai-itai disease as cadmium potentially interferes with mineralization of bone [8,9]. Cadmium is even declared a carcinogen [10]. The daily permissible limit for cadmium intake from various sources is 1.0-1.2 µg/g of human body weight as recommended by food scientists. According to the guidelines of United States Environmental Protection Agency (USEPA), the maximum cadmium content in drinking water is 5 ppb [11]. In this scenario, detection of cadmium content in water sources has become very important so that subsequent actions can be implemented for its removal or reducing to the minimal permissible level.

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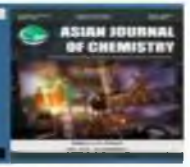

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A new polysaccharide-based ion-exchange resin for industrial wastewater treatment

Savita Bargujar[1)] (ORCID ID: 0000-0001-5392-597X), **Geetu Gambhir**[2), *)] (0000-0002-8995-9714), **Madhu Bala Raigar**[1), *)] (0000-0001-5711-5907), **Sunita Hooda**[2)] (0000-0001-8002-400X), **Dinesh Kumar Arya**[2)] (0000-0002-9716-0136), **Mamta Bhatia**[2)] (0000-0002-4176-4942)

DOI: dx.doi.org/10.14314/polimery.2022.5.4

Abstract: A new ion-exchange resin was obtained by incorporating a tripropylamine group into a tamarind polysaccharide resin (TTA). The TTA resin was characterized by FTIR, elemental analysis, and other physicochemical properties. The influence of pH, treatment time and resin concentration on the adsorption of metal ions from industrial wastewater was investigated. It was found that the obtained TTA resin effectively removes heavy metal ions in the following order: Fe^{2+}> Cu^{2+}> Zn^{2+}> Cd^{2+}> Pb^{2+}.

Keywords: industrial wastewater, tamarind, tripropylamine, ion-exchange resin, adsorption, flocculants.

Nowa żywica jonowymienna na bazie polisacharydów do oczyszczania ścieków przemysłowych

Streszczenie: Nową żywicę jonowymienną otrzymano poprzez wbudowanie grupy tripropyloaminowej do żywicy polisacharydowej tamaryndowca (TTA). Żywicę TTA scharakteryzowano za pomocą FTIR, analizy elementarnej i innych właściwości fizykochemicznych. Zbadano wpływ pH, czasu obróbki i stężenia żywicy na adsorpcję jonów metali ze ścieków przemysłowych. Stwierdzono, że żywica TTA skutecznie usuwa jony metali ciężkich w następującej kolejności: Fe^{2+}>Cu^{2+}>Zn^{2+}>Cd^{2+}>Pb^{2+}.

Słowa kluczowe: ścieki przemysłowe, tamaryndowiec, tripropyloamina, żywica jonowymienna, adsorpcja, flokulanty.

In India ground water is used for domestic as well as agricultural purposes. Heavy metals ions such as iron, cobalt, cadmium, lead, mercury, chromium, selenium, arsenic, copper and zinc are invariably present in groundwater.These metal ions are considered to be toxins when they enter inside the body exceeding the prescribed limit, wherein they start causing illness [1–3]. Some of the heavy metal ions such as iron, cobalt, cadmium, lead, mercury, Zn^{2+}, Cd^{2+}, Pb^{2+} have extensive applications in electronic appliances such as LED, Mobile phones, and other devices due to their chemical, electrical, optical and magnetic values [5]. Growing demand for reduction of metal ions in water has enhanced the strive for development of feasible ways to remove harmful metal ions from industrial contaminated water. Environmentally friendly adsorbents have been investigated for preferential adsorption

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Abstract: A new ion-exchange resin was obtained by incorporating a tripropylamine group into a tamarind polysaccharide resin (TTA). The TTA resin was characterized by FTIR, elemental analysis, and other physicochemical properties. The influence of pH, treatment time and resin concentration on the adsorption of metal ions from industrial wastewater was investigated. It was found that the obtained TTA resin effectively removes heavy metal ions in the following order: Fe^{2+}> Cu^{2+}> Zn^{2+}> Cd^{2+}> Pb^{2+}.

Keywords: industrial wastewater, tamarind, tripropylamine, ion-exchange resin, adsorption, flocculants.

Nowa żywica jonowymienna na bazie polisacharydów do oczyszczania ścieków przemysłowych

Streszczenie: Nową żywicę jonowymienną otrzymano poprzez wbudowanie grupy tripropyloaminowej do żywicy polisacharydowej tamaryndowca (TTA). Żywicę TTA scharakteryzowano za pomocą FTIR, analizy elementarnej i innych właściwości fizykochemicznych. Zbadano wpływ pH, czasu obróbki i stężenia żywicy na adsorpcję jonów metali ze ścieków przemysłowych. Stwierdzono, że żywica TTA skutecznie usuwa jony metali ciężkich w następującej kolejności: Fe^{2+}>Cu^{2+}>Zn^{2+}>Cd^{2+}>Pb^{2+}.

Słowa kluczowe: ścieki przemysłowe, tamaryndowiec, tripropyloamina, żywica jonowymienna, adsorpcja, flokulanty.

In India ground water is used for domestic as well as agricultural purposes. Heavy metals ions such as iron, cobalt, cadmium, lead, mercury, chromium, selenium, arsenic, copper and zinc are invariably present in groundwater.These metal ions are considered to be toxins when they enter inside the body exceeding the prescribed limit, wherein they start causing illness [1–3]. Some of the heavy metal ions such as iron, cobalt, cadmium, lead, mercury, Zn^{2+}, Cd^{2+}, Pb^{2+} have extensive applications in electronic appliances such as LED, Mobile phones, and other devices due to their chemical, electrical, optical and magnetic values [5]. Growing demand for reduction of metal ions in water has enhanced the strive for development of feasible ways to remove harmful metal ions from industrial contaminated water. Environmentally friendly adsorbents have been investigated for preferential adsorption

A new polysaccharide-based ion-exchange resin for industrial wastewater treatment

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Article

Assessment of Groundwater Quality for Drinking and Irrigation Use in Gurugram Block of Gurugram District, Haryana, India

May 2022 · Asian Journal of Chemistry 34(6):1555-1564 · Follow journal
DOI: 10.14233/ajchem.2022.23779

Vijay Laxmi · Jakir Hussain · Idris Husain · Geetu Gambhir

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Abstract

Groundwater is a vital and reliable source of water in all climates worldwide. In this work, a total of 26 groundwater samples were collected from the Gurugram Block of Gurugram District (a cosmopolitan city situtated proximately to capital of India) analyzed for electrical conductivity, pH, hardness, dissolved solids (TDS), Na^+, K^+, Ca^{2+}, Mg^{2+}, Cl^- and alkalinity as HCO_3^-, CO_3^{2-}. Based on the analytical results, the sodium adsorption ratio, sodium percentage, residual sodium carbonate, chloro-alkaline index, base exchange index, meteoric genesis index, permeability index), magnesium hazard and Kelly index were calculated. The most abundant cations were Na^+ and Ca^{2+}, which accounted for 43% and 36% of total cations, respectively. Based on median value, the cations are in the following order: $Na^+ > Ca^{2+} > Mg^{2+} > K^+$. There are no dangers in any of the 22 villages (85%). They have fluoride levels which are less than the maximum desirable limit of 1.0 mg/L established by IS: 10500, 2012. There were 15 villages

Polycyclic Aromatic Compounds
Volume 43, Issue 4, 2022, Pages 2908-2919

Research Article
Research Articles

A DFT Study on Diels-Alder Reaction of Dibenzazepine and 2,5-Dimethylfuran Using Different Solvents and Temperature Conditions

Shilpa Yadav [a], Neeti Misra [b], Pankaj Khanna [b], Mansi [a], Kriti Batra [a], Leena Khanna [a]

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Abstract

The Diels-Alder reaction involves cycloaddition of dienes and dienophiles to form a six-membered ring. The reaction involves the formation of adduct which can have two possible configurations, viz, endo and exo. For a vast majority of the Diels-Alder reactions, endo is the major adduct. This first ever study focuses on the Diels-Alder reaction between dibenzazepine and 2,5-dimethylfuran depicted by the computational method using Gaussian 16 software at different basis set levels. The formation of adduct is studied under different temperatures in the gas phase and aqueous medium. The kinetically favored endo adduct is preferred at low temperatures as compared to exo adduct. The adduct gets dehydrated further to give tribenzazepine as the final product. The applicability of the reaction is also proved experimentally in absence or presence of

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Chromone functionalized pyridine chemosensor for cupric ions detection

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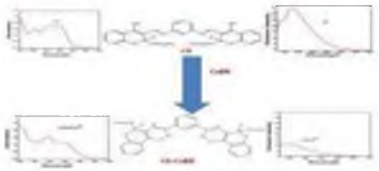
HIGHLIGHTS

- Chromone functionalized pyridine chemosensor was synthesized.
- CD can selectively detect cupric ions with limit of detection 1.2×10^{-6} M.
- The binding stoichiometry obtained as 1:2 for CD: Cu^{2+} complex from Job's plot.
- The Schiff base utilized for sensing cupric ions in a variety of spiked samples of water.

GRAPHICAL ABSTRACT



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ABSTRACT

A new Schiff base 2-ethoxy-3-{[(6-{[(2-ethoxy-4-hydroxy-2H-chromen-3-yl)methylidene]amino}pyridine-2-yl)imino]methyl}-2H-chromen-4-ol (**CD**) was synthesized as a result of the condensation of 2,6-diaminopyridine and 3-formyl chromone in 1:2 M ratio and used for cupric ions detection and characterized through FTIR, HRMS and ^{1}H NMR spectral techniques. The sensing capability of Schiff base for cupric ions as compared to other transition metal ions was examined by absorbance and emission studies. A considerable decrease in emission intensity appeared in Schiff base in the case of cupric ions while irrelevant changes were examined for the rest of the ions. The binding stoichiometry was obtained as 1:2 for **CD**: Cu^{2+} complex intended from the job's plot which was confirmed through HRMS spectral technique. DFT calculations were carried for the confirmation of structural relationships and absorption–emission data. The Regression coefficient, Limit of detection, and Association constant were obtained as 98.7%, 1.2×10^{-6} M, and 3.26×10^4 M^{-1} respectively using Benesi-Hildebrand (B-H) equation. The sensing power of Schiff base **CD** to recognize cupric ions was unaltered by the addition of the rest of metal ions, which was authenticated through interference studies. Schiff base **CD** and its complex with cupric ions were found stable over an extensive time period as revealed by time-reliant studies. The data collected by pH studies revealed that the preferred pH range for detecting cupric ions by Schiff base **CD** was 6 to 11. The Schiff base was finally utilized for sensing cupric ions in a variety of spiked samples of water like canal water, tap water, groundwater, distilled water.

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Chromone derived effective probe for the detection of metal ion (Cu^{2+}) and chemical explosive (p-nitrotoluene)

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Schiff base CCH
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ABSTRACT

A new chromone based Schiff base probe 1,3-bis({[4-oxo-4H-chromen-3-yl]methylidene}amino] urea (CCH) has been synthesized in one step by the condensation reaction between 3-formylchromone and carbohydrazide in a 2:1 M ratio. The characterization of CCH was done by employing various analytical techniques FTIR, ^{1}H NMR, ^{13}C NMR, HRMS and FESEM. The probe CCH showed a naked eye colorimetric response from colourless to yellow for the Cu^{2+} ions with greater selectivity over other metal ions taken for analysis. The binding constant and limit of detection of CCH for Cu^{2+} ions were calculated to be $4.5 \times 10^3 M^{-1}$ and 11.4×10^{-7}M, respectively, using UV-Visible titrations. The DFT (Density functional theory) results also confirmed the experimental studies. In addition, CCH has shown its applicability for the detection of nitroaromatic compound i.e., p-nitrotoluene (pNT). The sensing mechanism of pNT was studied by UV-Visible and fluorescence studies. A significant quenching of the emission intensity of CCH at 402 nm in the case of pNT was noted above other nitroaromatics taken for study. The binding constant and limit of detection for pNT were calculated to be $1.2 \times 10^2 M^{-1}$ and 25×10^{-6}M, respectively, using B-H plot. The presence of other nitroaromatics negligibly affects the detection of pNT in CCH solution, as confirmed by anti-interfering studies. FESEM analysis of CCH with pNT confirmed the formation of an adduct. The time resolved fluorescence lifetime measurement also ensured the CCH-pNT adduct formation and the average life time data revealed that the quenching process was dynamic. The CCH-pNT adduct formation was also validated via DFT studies. Overall results suggested that the Schiff base CCH could be an efficient option to detect Cu^{2+} ions colorimetrically and pNT by fluorimetrically.

1. Introduction

Schiff bases are compounds having an active imine linkage (C – N) which is prominently responsible for their various applications in several fields [1,2]. Nowadays, Schiff bases are primarily used as colorimetric and optical sensors for the detection of different analytes such as; metal ions, anions, explosives, etc. [3–9]. This is possible because they possess strong binding affinity towards metal ions to form stable complexes [10,11]. Schiff bases are electron-rich compounds, which makes them suitable for the sensing of nitroaromatics (electron-deficient species) by providing an easy electron transfer process from ligand to nitroaromatics [12]. Several chemosensors other than Schiff bases are also known for analyte detection, but Schiff bases are more preferred now days because of their simplicity, high stability, structural flexibility and an easy synthetic route, in addition they produced with a water molecule as a side product only [13,14]. A number of analytical methods have been introduced for the detection of analytes using chemosensors, namely; fluorescence sensing, electrochemical sensing, atomic absorption spectroscopy, inductively coupled plasma-mass spectrometry, surface-enhanced Raman spectroscopy (SERS), chemiluminescence, thermal neutron analysis, cyclic voltammetry, high performance liquid chromatography (HPLC), energy-dispersive X-ray diffraction, gas chromatography (GC), [15–20]. Among these methods, colorimetric sensing and optical sensing (UV-Vis and fluorescence) are more suitable because of their cost-effectiveness, easy sample preparation, high selectivity, sensitivity, and rapid detection of analytes, which makes them more useful tools over other techniques. Colorimetric detection is more facile approach as it involves the naked eye detection of the analyte with less equipment [21,22]. Imbalanced consumption of metal ions can cause severe environmental and health issues [23]. As a result, the design and synthesis of sensors for the detection of such ionic species are crucial. Copper is the third most abundant trace element in

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WET CHEMICAL GROWTH OF ONE DIMENSIONAL ZnO FILM

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ABSTRACT

The present work focuses on the growth of ZnO films vertically on indium tin oxide substrate using a wet chemical method. The morphological and structural study of the prepared films confirmed the formation of one-dimensional growth with a polycrystalline single-phase hexagonal wurtzite structure. The computed texture coefficient indicates the c-axis growth of the film. The optical spectra study exhibited a strong and sharp characteristics absorption band. The numerical derivative method and the Tauc plot method for the different transition values have been used to compare energy bandgap calculations.

Keywords: ZnO Film, SEM, XRD, Rietveld Refinement, UV-Visible Spectroscopy, Tauc Plot Method

INTRODUCTION

In the recent era, metal oxide nanostructures showcase many applications in every field that exists, mainly biosensors, solar cells, photocatalysis, bio-imaging, UV-light emitters, piezoelectric transducers, chemical sensors.[1] There are many metal oxide nanostructures existing in nature, out of which ZnO is the most promising nanostructures (nanomaterial) due to its wide bandgap, thermal stability, high electron mobility, conductance variability, etc.[2] According to the literature, these ZnO nanostructures can be subdivided into various categories such as nanodots, nanoflowers, nanowires, nanopores, nanotubes, nanorings, nanorods, etc.[1] Among these, nanorods and nanowires are being extensively used for practical applications, such as nanowires are used for field-effect transistor (FET) devices, nanogenerators, and nanorods are used for heterojunction devices such as varistors, four-probe electrode systems, sensing applications, etc.[3-6] In addition to these applications, ZnO nanorods in the form of films are being used in FET, dye-sensitized solar cells (DSSCs), light emitters, light detectors, biosensors, gas sensors, etc.[7,8] Various methods are reported in the literature for synthesizing these nanorods, such as electrochemical deposition technique, hydrothermal method, sputter chemical deposition, etc.[9-10] However, certain criteria need to be met to use these methods, mainly high reactant concentration, and high reaction temperature. On similar grounds, these processes are complex and expensive. Therefore, the more accessible approach to synthesize ZnO nanorods is by using the wet chemical method due to its easy processing and cost effectiveness.[11-12]

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An *In Silico* investigation for acyclovir and its derivatives to fight the COVID-19: Molecular docking, DFT calculations, ADME and td-Molecular dynamics simulations

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ABSTRACT

In the present work, we have designed three molecules, acyclovir (A), ganciclovir (G) and derivative of hydroxymethyl derivative of ganciclovir (CH_2OH of G, that is D) and investigated their biological potential against the Mpro of nCoV via in silico studies. Further, density functional theory (DFT) calculations of A, G and D were performed using Gaussian 16 on applying B3LYP under default condition to collect the information for the delocalization of electron density in their optimized geometry. Authors have also calculated various energies including free energy of A, G and D in Hartree per particle. It can be seen that D has the least free energy. As mentioned, the molecular docking of the A, G and D against the Mpro of nCoV was performed using iGemdock, an acceptable computational tool and the interaction has been studied in the form of physical data, that is, binding energy for A, G and D were calculated in kcal/mol. It can be seen the D showed effective binding, that is, maximum inhibition that A and G. For a better understanding for the inhibition of the Mpro of nCoV by A, G and D, temperature dependent molecular dynamics simulations were performed. Different trajectories like RMSD, RMSF, Rg and hydrogen bond were extracted and analyzed. The results of molecular docking of A, G and D corroborate with the td-MD simulations and hypothesized that D could be a promising candidate to inhibit the activity of Mpro of nCoV.

1. Introduction

Drug repurposing is the concept of utilising the FDA approved drugs for a new problem, infection or illness other than the one for which it was originally approved. These repurposing drugs save the time and money, accelerated their admittance into experimental clinical trials against other diseases. This process involved the activity based on an experimental or computational approach to develop the new employ of a drug for its biological potency [1–3]. COVID-19 is named for corona-virus disease-19 and it can cause a range of illness from common cold to severe respiratory syndrome and also infects other organs of the body. Coronaviruses (CoV) are a family of encapsulated viruses with single-strained RNA and pathogen. In comparison of previously identified SARS-CoV (2002) and MERS-CoV (2013), SARS-CoV-2 or nCoV is a more virulent variant [4–7]. New SARS-CoV has recently received huge attention worldwide and has been declared as a public health emergency of global concern. Repurposing drug like acyclovir is a well-known antiviral drug and was approved for the treatment of infections due to herpes viruses and zoster virus. A clinical research report has been published, showing the acyclovir as a promising drug against the infection due to SARS-CoV-2 [8]. Heidary et al. has reported a study for acyclovir to be a potential candidate against COVID-19 [9]. Acyclo-GTP is a more efficient inhibitor of viral DNA. Ganciclovir and acyclovir have shown good efficacy against cytomegalovirus infection [10]. A case has

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II-VI core/shell quantum dots and doping with transition metal ions as a means of tuning the magnetoelectronic properties of CdS/ZnS core/shell QDs: A DFT study

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ABSTRACT

This paper examines the alterations in the properties of II-VI Quantum Dots (QDs) when these are coated with a shell made of another material of the same family and investigates the structural, electronic and magnetic properties of doped CdS/ZnS core/shell QDs. The core/shell QDs have been constructed by building the shell over the bare core QD and it is found that this construction of a shell over the bare QD can bring about dramatic changes in its optical properties. On changing the shell by varying either the cation or the anion, substantial variations are brought about in the band gap and electrophilicity. The trend of Fermi energies is more negative for core/shell QDs than for the QDs without a shell, and the value is almost the same for core/shell QDs with the same core. Swapping of the core and the shell materials brings greater stability in the case of shells of the wider band gap materials. Binding energy data demonstrates that the CdS/ZnS, CdSe/ZnSe, CdSe/CdS core/shell systems are more stable than ZnS/CdS, ZnSe/CdSe, CdS/CdSe core/shell systems, respectively. An augmentation in the properties is found on doping the QD with transition metal ions. The binding energies are found to be functions of the kind of dopant as well as the spin multiplicity and accounts for the stability of one spin state over the other at a specific site of the QD. The most fascinating property that plays a decisive role in the extent work is the introduction of magnetism in core/shell QDs as a result of the entry of unpaired electrons within the CdS/ZnS QDs on doping with transition metal ions. The deviation of the observed magnetic moments from the expected values increases as the dopant is varied from Mn^{2+} to Fe^{2+} to Co^{2+} to Ni^{2+} to Cu^{2+}. Hirshfeld charge analysis shows that the doped ion accepts negative charge from the sulfide ions in the core, with the smallest charge transfer seen in the case of Hg^{2+} ions. As we move from Mn^{2+} to Hg^{2+}, the trend followed for the Hirshfeld charges indicates that the overall charge on the core is lower and that on the shell is higher for all the doped cases in comparison to the undoped CdS/ZnS core/shell QD. The band gap values reveal that the Fe^{2+} doped CdS/ZnS core/shell structures have the smallest band gaps. Hence, we expect that this paper will help researchers to develop a strategy to produce QDs of the anticipated properties for various applications, and transition metal ions can be successfully employed for modification of various magnetoelectronic properties of the host semiconductor for future applications in nanotechnology.

1. Introduction

Recent advances in the synthesis of highly monodisperse nanocrystallites have paved the way for numerous spectroscopic studies assigning the quantum dot (QD) electronic states and mapping out their evolution as a function of size. QDs, due to their reduced dimensions, have very high surface to volume ratios, with roughly 80% of the atoms residing on the surface. Hence, their optical and structural properties are significantly affected by the atoms present on the surface. The presence of atoms on the surface with unsaturated valencies, called surface defects, leads to the generation of surface trap states acting as non-radiative recombination sites, which degrade the fluorescence quantum yield of the QDs [1]. On passivating the QD surface with organic ligands, these trap states get reduced, but still the complete passivation of surface defects does not occur. In order to passivate the surface in a more complete manner, a secondary layer of semiconductor may be

Abbreviations: QDs, Quantum dots; NCs, Nanocrystals; DOS, Density of states; PDOS, Partial density of states; DFFP, DFT–semilocal pseudopotentials.

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Full Length Article

Precisely engineered type II ZnO-CuS based heterostructure: A visible light driven photocatalyst for efficient mineralization of organic dyes

Bhawna Kaushik [a], Sneha Yadav [a], Pooja Rana [a], Pooja Rana [b], Kanika Solanki [a], Deepti Rawat [b], R.K. Sharma [a,*]

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Visible light
Recyclability
Photocatalytic
Heterojunction catalyst
Environmental remediation
Core-shell architecture

ABSTRACT

Herein, type-II band alignment of magnetic ZnO/CuS has been achieved by assembling p-type CuS nanoparticles on n-type ZnO heterostructures to accomplish the photocatalytic degradation of two colored cationic dyes, namely, methylene blue (MB) and toluidine blue (TB). The material exhibited excellent photocatalytic efficiency towards MB and TB with 93% and 87.5% degradation in just 16 and 18 min respectively. The efficacy of doped photocatalyst (FSZCS) was found to be 6 times higher than the undoped material (Fe_3O_4@SiO_2@ZnO; FSZ) whereas pristine CuS degraded only 50% of the dye sample under identical conditions. Therefore, the dramatic enhancement of the photocatalytic degradation performance could be attributed to the synergetic effect created by doping CuS over magnetic ZnO nanocomposites which extended the photoresponse of ZnO by driving the entire degradation process under visible light irradiation and also reducing the charge recombination rate. The plausible mechanistic pathway and identification of degradation products was discussed in detail on the basis of scavenger studies as well as GC–MS analysis. Furthermore, the designed catalyst could be recycled and reused up to 5 runs without any significant decrease in its photocatalytic activity. The reported procedure exhibited multiple advances as it proceeded by utilizing renewable household LEDs as power source at room temperature without the use of any additional oxidant under neutral pH conditions thus, paving a strong path towards sustainable, green and responsible chemistry.

1. Introduction

Photocatalytic degradation has surfaced as a burgeoning technique contributing immensely towards environmental remediation via the use of renewable, clean and abundant solar energy [1]. As a green and sustainable approach, it has found numerous applications in the arena of treatment of perilous and toxic effluents such as dyes, pesticides, pharmaceutical by-products, industrial waste etc. A wide range of photo-responsive materials like metal oxides, metal nitrides and oxy-nitrides, alkali metal base, metal sulfides and carbon-based components have been employed for carrying out the degradation of harmful organic pollutants into environmentally benign products [2–6]. Amongst them, metal oxide and sulfide based semiconductors have occupied a central place in the field of environmental reformation owing to their wide band gap due to deep 2p oxygen orbital in their valence band [7,8]. The process is set off by the generation of electrons when light with wavelength lesser than or equal to the band gap of the semiconductor is illuminated in turn separating the charge carriers (electrons and holes). Semiconductors with wide band gap such as TiO_2 and ZnO have invariably proved their worth as dynamic photocatalysts [9–11]. ZnO specifically with a band gap of 3.37 eV has the potential of detoxifying water owing to its prominent reaction and mineralization rates, lower toxicity, economic nature, higher number of active sites and the fact that it can be moulded to obtain various morphologies [12]. Unfortunately, it works best in the UV region, which constitutes less than 5% of the solar energy thus conspicuously confining its photocatalytic utility. Another factor limiting its photocatalytic efficiency is the rapid charge recombination. Therefore, it is indispensable to shift the optical absorption band of ZnO towards the visible range and simultaneously circumvent the issue of charge recombination [13]. One of the simplest yet appealing pathway to overcome this roadblock is by doping such single-component semiconductor with another narrow band gap semiconductor which can synergistically bring the band gap in visible region and ensure prolonged separation of charge carriers [14]. Copious

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Ingeniously designed Silica nanostructures as an exceptional support: Opportunities, potential challenges and future prospects for viable degradation of pesticides

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Silica nanostructures
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ABSTRACT

Despite significant advancements in modern agricultural practices, efficient handling of pesticides is a must as they are continuously defiling our terrestrial as well as aquatic life. During the last couple of decades, substantial efforts by various research groups have been devoted to find innovative solutions to remove pesticides from our environment in a greener way. In this regard, functionalized silica nanoparticles (NPs) have gained considerable attention of scientific community due to their notable properties such as amenable design, large surface area as well as fine-tunable and uniform pore structures which make them an ideal material for pesticides removal. The present review aims to proffer current scientific progress attained by silica-based nanostructures as an excellent material for effective removal of noxious agrochemicals. Further, a brief discussion on the synthetic strategies as well as intrinsic merits associated with different morphologies of silica have also been highlighted in this article. It also summarizes the recent reports on silica assisted degradation of pesticides via enzymatic, chemical as well as advanced oxidation protocols. Additionally, it presents a critical analysis of different support materials for decontamination of our ecosystem. The review concludes with potential challenges, their possible solutions along with key knowledge gaps and future research directions for successful deployment of silica supported materials in degradation of pesticides at commercial scale.

1. Introduction

For many decades, population spurt has been a topic of deliberation and preoccupation calling for an immediate action to intensify the global agricultural production to ensure food security. According to the "World Population Prospects 2019", a United Nations (UN) report, world population is further expected to reach 9.7 billion by 2050 (UNDA, 2019). Thus, the ever-expanding number of inhabitants stresses on the requirement to boost the crop production without increasing farmland footprint. To enhance crop productivity and make agriculture profitable in face of rising valuation, use of pesticides, herbicides and fertilizers have proliferated exponentially. Pesticides refer to a group of chemical compounds used to kill undesirable organisms in farmlands and have been playing a pivotal role in agronomics since the dawn of agricultural revolution (Rani et al., 2021). According to their usage, pesticides can be classified broadly in four categories namely, herbicides, insecticides, fungicides and rodenticides. Synthetic organic pesticides generally contain carbamates, organophosphates, coumarins, organochlorines, organonitrogens, pyrethroids along with arsenic and mercury derivatives (Rani et al., 2017).

Nevertheless, with the rapid development and proliferation of chemical industries, their indeterminate and sporadic use has led to 200,000 human deaths annually along with the contamination of natural resources (Bano et al., 2017). Most of the chemical pesticides are retained within the body of organism because of their lipophilicity and exhibit detrimental effects on human health due to their carcinogenic nature and ability to damage central nervous system (Saharwal et al., 2018). Starting from flora to fauna, pesticides owing to their longer half-lives not only extensively accumulate but also remain persistent in water and soil, thereby posing serious threat to the environment (Fernandez-Perez et al., 2011; Liu et al., 2016a). Another major limitation associated with the use of conventional pesticides is that their

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Issue 18, 2022

From the journal:
New Journal of Chemistry

Magnetically separable type-II semiconductor based ZnO/MoO_3 photocatalyst: a proficient system for heteroarenes arylation and rhodamine B degradation under visible light†

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Author affiliations

Abstract

Herein, a new strategy is used to systematically tailor the band arrangement in a ZnO-based heterostructure to realize its bifunctionality towards the synthesis of heteroarylated products and degradation of Rhodamine B under visible light. A Type-II band alignment transition is carried out *via* introducing MoO_3 rods which subsequently enhance its light-harvesting properties, prolonged charge separation and abundant active sites. The designed heterostructure displayed broad functional group compatibility for both electron-donating and electron-withdrawing group substituted substrates with good product yield. Comparably, their visible light driven heteroarylation process is significantly enhanced to more than 4 times that of pristine ZnO and is superior to most photocatalysts reported previously. ZnO/MoO_3 also displayed remarkable degradation ability of 96.8% towards RhB into innocuous products under neutral conditions without utilizing any oxidant. More impressively, the developed catalyst demonstrated long-term stability and excellent reusability up to five runs without any significant change in efficiency. Hence, this work not only for the first time exhibits the untapped potential of using a highly active, economically efficient and magnetically separable ZnO/MoO_3 core–shell heterostructure to substitute for expensive metals in photocatalysis but also presents a new opening for synthesising hybrid materials with excellent performance in environmental remediation.

Issue 6, 2022

From the journal:
Dalton Transactions

An Earth-abundant cobalt based photocatalyst: visible light induced direct (het)arene C–H arylation and CO_2 capture†

Pooja Rana,[a] Bhawna Kaushik,[a] Rashmi Gaur,[a] Sriparna Dutta,[a] Sneha Yadav,[a] Pooja Rana,[a] Kanika Solanki,[a] Bhavya Arora,[a] Ankush V. Biradar,[b] Manoj B. Gawande[c] and R. K. Sharma[*a]

Author affiliations

Abstract

In this work, we have reported a noble metal free heterogeneous photocatalyst to carry out direct (het)arene C–H arylation and solvent-free CO_2 capture *via* single-electron transfer processes at room temperature and under pressure. The catalytic system comprises a cobalt(III) complex grafted over the silica coated magnetic support for the efficient recovery of the photocatalytic moiety without hampering its light harvesting capability. The novel Earth-abundant cobalt(III) based photocatalyst possesses various fascinating properties such as high surface area to volume ratios, large pore volume, crystalline behaviour, high metal loading, excellent stability and reusability. The general efficacy of the highly abundant and low-cost cobalt based heterogeneous nanocatalyst was checked for the selective conversion of aryldiazonium salts into synthetically and pharmaceutically significant biaryl motifs under ambient conditions upon irradiation with visible light. The highly efficient photocatalytic conversion of carbon dioxide (CO_2) to a value-added chemical was accomplished under mild reaction conditions with high selectivity, showing the added benefit of operational simplicity.

Magnetic Boron Nitride Nanosheets Decorated with Cobalt Nanoparticles as Catalyst for the Synthesis of 3,4-Dihydropyrimidin-2(1*H*)-ones/thiones

Pooja Rana, Ranjana Dixit, Shivani Sharma, Sriparna Dutta, Sneha Yadav, Bhavya Arora, Bhawna Kaushik, Pooja Rana, and Rakesh K. Sharma*

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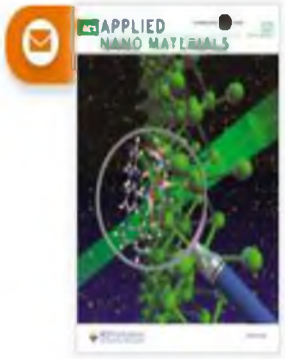
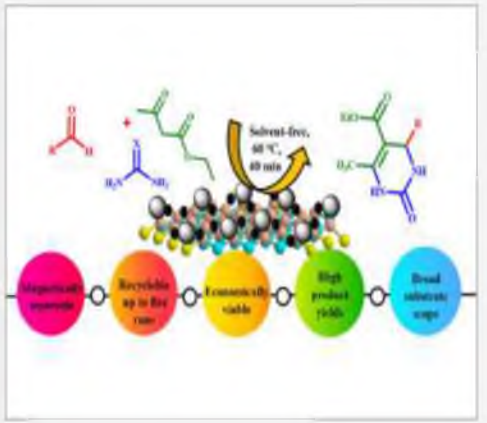


ACS Applied Nano Materials

Read Online | PDF (12 MB) | Supporting Info (1) » | SUBJECTS: Catalysts, Cobalt,

Abstract



Atomically thin two-dimensional boron nitride nanosheets have spawned futuristic advancements in the arena of nanocatalysis research through their intriguing capability to act as exceptional support matrixes. Motivated by their phenomenal attributes, we have fabricated a magnetic boron nitride nanosheet-based cobalt catalytic system wherein boron nitride nanosheets are initially integrated with magnetic Fe_3O_4 nanoparticles (NPs), and the resulting nanostructure is further surface-engineered with cobalt NPs to yield an *h*-BN/Fe_3O_4/Co hybrid. For gaining an insight into their structural and morphological features, reliable spectroscopic and microscopic characterization techniques including TEM, SEM, XRD, FT-IR, VSM, ED-XRF, XPS, BET, TGA, and AAS were employed. The developed nanohybrid material was then utilized to provide ready access to a library of highly bioactive 3,4-dihydropyrimidin-2(1*H*)-ones/thiones under ambient conditions. A plausible mechanistic route for furnishing 3,4-dihydropyrimidin-2(1*H*)-ones catalyzed by *h*-BN/Fe_3O_4/Co has also been delineated. Ambient reaction conditions, solvent-free conditions, high product yield, and excellent thermal and mechanical stability of the catalyst along with facile magnetic retrievability and efficient recyclability are some of the phenomenal characteristics of this methodology. The present protocol besides exhibiting a wider functional group tolerance and a high turnover number was devoid of any additive, thus making it superior to literature precedents reported to date. In consideration of the striking catalytic activity of the *h*-BN/Fe_3O_4/Co nanomaterial, it can be anticipated that the present catalyst can not only possess a stupendous potential to expedite substantial manufacturing of other industrially demanding organic motifs but may also unlock insights for designing next-generation 2D catalytic materials.

KEYWORDS: nanocomposites, heterocyclic motifs, heterogeneous catalytic system, catalytic efficacy, recoverability, recyclability

Issue 22, 2022

From the journal:
New Journal of Chemistry

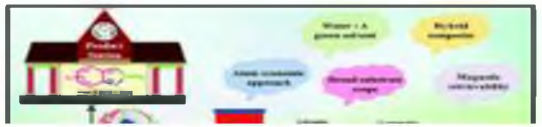
Unravelling the catalytic potential of a magnetic $CoFe_2O_4$/Cu–ABDC MOF composite in the sustainable synthesis of 2*H*-indazole motifs†

Sneha Yadav,[a] Ranjana Dixit,[a] Shivani Sharma,[a] Sriparna Dutta,[a] Bhavya Arora,[a] Pooja Rana,[a] Bhawna Kaushik,[a] Kanika Solanki[a] and Rakesh K. Sharma [a]

Author affiliations

Abstract

Incessant advancements made in catalytic processes during the past few decades prompted researchers to design prodigious sustainable materials that lie within the domain of green synthesis. From this perspective, metal organic frameworks (MOFs) with abundant chemical functionalities and ultra-high chemical as well as structural tunability have emerged as the most prolific heterogeneous catalysts in synthetic organic chemistry. Herein, we report the fabrication of a magnetic $CoFe_2O_4$/Cu–ABDC (ABDC = 2-aminoterephthalate) hybrid composite *via* a one-pot solvothermal strategy whose catalytic efficiency has been investigated in a three-component coupling reaction to obtain biologically active and pharmacologically significant 2*H*-indazole scaffolds (up to 98% yield). By integrating magnetic inverse spinel cobalt ferrite nanoparticles with the functional properties of the MOF, two most important parameters, *i.e.* environmental compatibility and recyclability, have been well established on a single platform. Aided by the advanced microscopic, spectroscopic and property characterization tools, the morphological as well as structural information of the developed hybrid composite has been deduced well. The aim of this study is to design a sustainably viable process that would provide highly demanding pharmacophores, *i.e.* 2*H*-indazoles, in surprisingly high yields from comparatively cheap benchmark substrates – "substituted anilines, 2-bromobenzaldehydes and sodium azide". Furthermore, our protocol has successfully accomplished the remarkable task of replacing toxic volatile organic solvents with eco-friendly solvents such as water. A broad substrate scope, high atom economy, ambient and greener reaction conditions devoid of any ligands, additives or activators, a lower reaction time and temperature, a high turnover frequency and magnetic retrievability are some of the salient features of this methodology which render it highly promising in industry and academia. Besides, the present study is the first report employing a magnetic MOF as a heterogeneous catalyst for the preparation of 2*H*-indazole moieties.



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Review

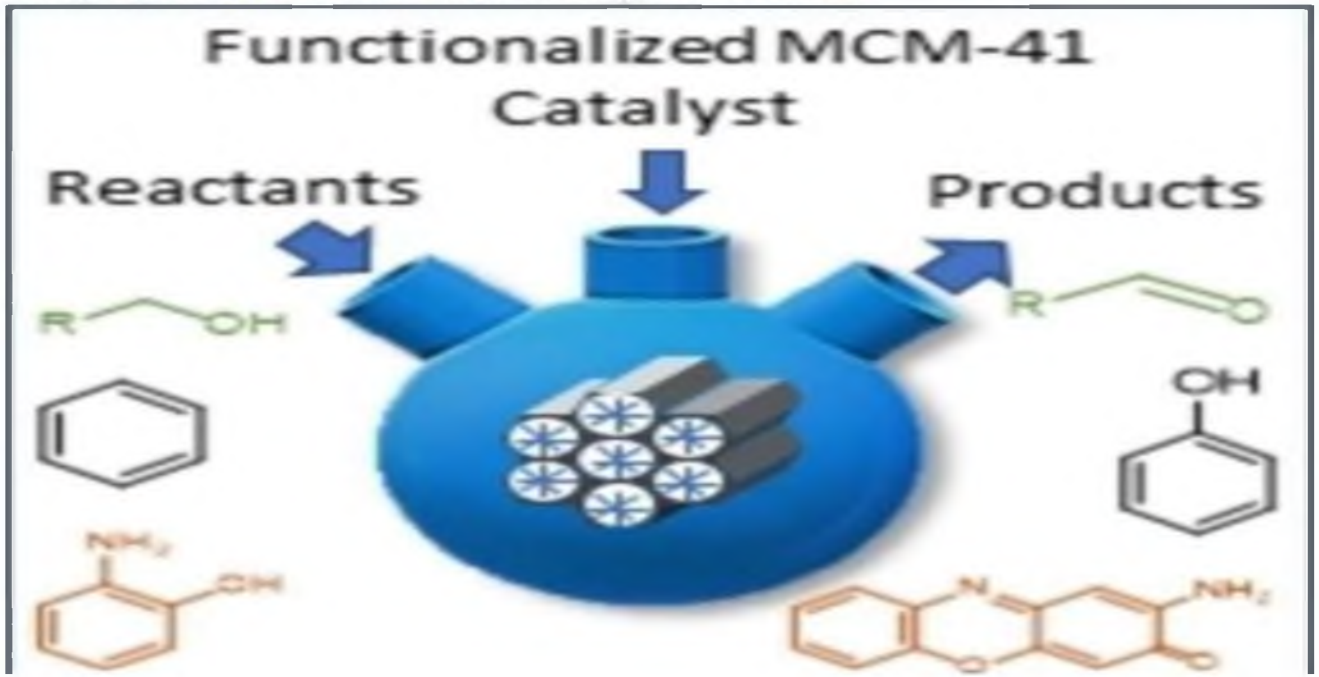
Functionalized MCM-41: Versatile Catalysts for Organic Transformations

Dr. Sharda Pasricha, Dr. Pragya Gahlot, Dr. Kavita Mittal, Devansh Rai, Nishita Avasthi, Harsimar Kaur, Shruti Rai

First published: 17 February 2022 | https://doi.org/10.1002/slct.202103674 | Citations: 7

Graphical Abstract

The scope of seven surface functionalized MCM-41 catalysts in organic transformations discussed. Functionalized MCM-41 are innovative and need based catalyst systems for reactions like Sonogashira, Suzuki, Heck, Aldol, Knoevenagel, Friedel Craft reaction and Pechmann condensation etc. Several other reactions like oxidation, reduction, dehydration, esterification, trans-esterification, epoxidation as well as C–S, C–N, C–O and S–S coupling reactions also possible with MCM-41 based catalysts. Multicomponent synthesis of bioactive heterocycles is reported. Major challenges and future prospects of functionalized MCM-41 catalysts are discussed.



Coupling Fear and Contagion for Modeling Epidemic Dynamics

Publisher: IEEE

Cite This

PDF

Kirti Jain ; Vasudha Bhatnagar ; Sadanand Prasad ; Sharanjit Kaur All Authors

Abstract:

The emotion of fear related to an infectious disease not only influences an individual's behavior but also transmits to social contacts. Therefore, modeling human behavior is a precursor to reliable estimates of epidemic size and duration. In this paper, we present an abstract model of fear, which is realized using an Individual-based Fear Model (IBFM). In this model, fear is coupled with contagion to study the influence of human behavior on epidemic dynamics. Since fear is an inherent characteristic of an individual that determines susceptibility to infection, the model discerns between individuals by maintaining a fear-index . Variations in innate fear levels in populations with cultural differences are also accommodated. Since the fear level of individuals is affected by the changing size of the epidemic, IBFM provides a mechanism to update fear in the population realistically. The mechanism gives rise to multiple epidemic waves observed in real-world epidemics. We compare the epidemic dynamics for IBFM and differential equation-based realization of the abstract model. We present a detailed empirical study to understand the interplay of fear and contagion in IBFM.

Behaviour of motion of infinitesimal variable mass oblate body in the generalized perturbed circular restricted three-body problem

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Abstract. The main goal of the present study is to reveal the behaviour of motion of the infinitesimal body in case of circular restricted three-body problem where all the participating bodies have oblate shapes and both primaries have the effect of solar radiation pressure. The third infinitesimal body is varying its mass according to Jeans law. We also consider that the system is affected by the small perturbations in Coriolis and centrifugal forces. We evaluate the equations of motion of the infinitesimal oblate body under the generalized sense in the perturbed circular restricted three-body problem by using the Meshcherskii-space time transformations to preserve the dimensions of the position as well as time, and then determine the Jacobi-integral. Further we numerically illustrated the equilibrium points, Poincaré surfaces of section, regions of possible and forbidden motion and then basins of the attracting domain by supposing the effects of all the parameters used. Further more, we examine the stability of these

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Behaviour of motion of infinitesimal variable mass oblate body in the generalized perturbed circular restricted three-body problem

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Study and prediction of prostate cancer using fuzzy inference system

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ARTICLE INFO

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Keywords:
Fuzzy logic
Fuzzy expert system
Prostate cancer
Prostate specific antigen
Prostate volume
% Free prostate specific antigen

ABSTRACT

The essential driver of passing among men on the planet is prostate disease. In the chief stage, for early identification of the prostate disease by applying Fuzzy Inference System (FIS) has been depicted in this study. The age of the patient, Prostate Volume (PV), % Free PSA (FPSA) and Prostate Specific Antigen (PSA) are utilized as input parameters in FIS for computing the risk factor of the prostate cancer. In this study Mamdani method is used for evaluation and analysis of the Prostate Cancer Risk (PCR). The present FIS additionally required the base estimation decreases horribleness lessens dismalness, mortality and more dependable from other system. It can likewise be considered in medicine to decrease manual assignments and human mistake. This review advocate that, this FIS might consequence on work on the productivity to recognized the distinctive kind of the malignant growths just as lessening the expense of care of the patients.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Materials, Machines and Information Technology-2022

1. Introduction

In the past decades, Egawa et al. [10] used PSA renders for differentiating prostate carcinoma, Catalona [7] used PSA concentrations for detection of Prostate cancer, Allahverdi, and Yaldiz, [1] developed and design the pre-diagnosis expert system for medicine. Roehrborn et al. [27] investigates the growth of prostate by Serum PSA which was a stronger predictor. Boegla et al. [5] applied fuzzy knowledge to use fuzzy system, while in same time Lascio [18] developed a fuzzy system analysis of diabetic neuropathy. Allahverdi [2] investigates the impact of fuzzy set theory in to numerous medical difficulties with Artificial intelligence which extensively used in various fields including robotics, marketing, medical applications. Numerous expert systems were considered for progress of Fuzzy logic which plays a significant part in medication regions [24] to predict the forecast to treatment with citalopram in liquor dependency [30] to investigate diabetic neuropathy [18]; To investigate the volumes of brain tissue for the MRI to analyse the MRI data [19]; and to investigate the blood pressure by using fuzzy logic. Lu et al. [19] developed fMRI activation detection for image segmentation without supposition of time series. PERSI et al. [25] investigate a fuzzy expert system to diagnosis of prostate cancer by input parameters as PSA (prostate specific antigen) and PV (prostate volume) and PCR (prostate cancer risk) output parameter.

Gawedal, Brier, and Zurada [11,12] developed and used a fuzzy rule-based system to help the doctors who decided about the dose of medicine to treat the 200 dialysis patients. Danaei et al. [8] analysed first time to give cause of cancer and their 12 attributes with nine risk factors. Benecchi [4] developed a fuzzy neuro system which gave good accuracy other than tPSA (total prostate-specific antigen) and %FPSA (percent free PSA) for detection of prostate cancer. Miller et al. [22] has set the limit by using particular PSA value for detection of prostate cancer and discusses their testing. Keles et al. [14] investigates neuro fuzzy system rules for

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Selling price, time dependent demand and variable holding cost inventory model with two storage facilities

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ARTICLE INFO

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Available online 1 February 2022

Keywords:
Own Warehouse (OW)
Rented warehouse (RW)
Sensitivity analysis
Holding cost
Multivariable demand

ABSTRACT

Customer service stock-out rates, as well as the company's business sales and marketing productivity, are controlled by the storage facility (warehouse). In this study, a two- storage production inventory model with demand dependent on price and time described. The rate of demand is governed by the selling price and the time. In this analysis, we hypothesized that the deterioration rate is constant and that the holding cost for own storage is time-dependent (OW). For rental storage, the deterioration rate is considered to be time-dependent, while the holding cost is assumed to be constant (RW) which is more realistic. This study assists to reduce total inventory costs by finding the best replenishment strategy. A numerical example is used to demonstrate the model's method, as well as a sensitivity analysis on a few parameters.

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1. Introduction

A storage facility (warehouse) is a huge structure where raw supplies or produced substances are kept till; they are exported or dispersed to trade outlets for sale. In recent years, the problem of two storage or two shops inventory models has received a lot of attention in the beginnings of multi-national enterprises. Two storage facility models play an important role for middle-order retail outlets and smaller shops of multinational companies to stay competitive for sale prices. When the price of commodities becomes less than purchasers can purchase quantities in bulk so it becomes important to purchasers to keep this extra stock in the storage house (warehouse).

Several scholars have addressed a variety of two-warehouse inventory models throughout the previous two decades. Hartley [9] was the first to suggest this type of system. They assumed that the holding cost of RW was higher than that of OW in that scenario. Sarma [20] investigated inventory model of two storage facilities and having an optimum release rule and extend the Hertly model by considering the cost of transportation. Murdeshwar and Sathe (1985) developed lot size two shop model and consider the rate of production fixed. Sarma [21] and Benkherouf [1] investigated an order level deterministic model with two warehouses and consider the preserving capacities in a leased warehouse were higher for those who kept goods in own warehouse. Dave [4] modified the model of Sarma [20]. Sarma [22] extended and investigated the two shop model developed by Dave [4] under effect of two new parameters. Goswami and Chaudhuri [8] developed a linear trend of demand an EOQ model with two storage facilities for worsening items.

Pakkala and Achary [16] developed two shop model dependent on discrete time and Pakkala and Achary [17] generated release rule for warehouse or storehouse when purchaser purchased deteriorating goods in bulk. Bhunia and Maiti [2] extended a two shops model in which Stock level reliant on the rate of consumption. Bhunia and Maiti [3] modified and devolved two shop model for decaying products by considering continuous release rule for transferring goods from shops. Wu [25] investigated a two shops model by considering a demand function constant as well as deter-

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TWO WARE-HOUSES FUZZY INVENTORY MODEL FOR DETERIORATING ITEMS WITH RAMP TYPE DEMAND AND SHORTAGES

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Chaman Singh, Acharya Narendra Dev College

ABSTRACT

In this paper we developed a fuzzy inventory model for single spoilage two-parameter weibull-distribution degradation rate, ramp type demand, and partial backordering at a constant rate. In the current market scenario, an increase in the cost of the inverter affecting the total cost of inventory costs due to inflation can increase at any time of the order length.The increase in the cost of the components of the inventory cannot be pre-determined due to the uncertainty of the market situation. Therefore, we have considered the interval based fuzzy concept to handle the uncertainty condition. Ordering cost, the cost of holding in both ware-houses is considered a triangular fuzzy number.

Keywords: Weibull deterioration distribution; Partial backlogging; Rramp type demand; Fuzzy holding cost; Ordering cost.

INTRODUCTION

In traditional models, many researchers have considered the rate of demand to be constant, linear time dependent, stock dependent or accelerating over time and the same trend of considering this type of demand still continues but it is not always true that demand occurs in the same pattern. The assumption of a constant demand rate is generally valid in the mature phase of a product's life cycle. Several models have developed inventory models for items stored in two ware-houses under modelling assumptions. The rate of demand in these models is assumed to be constant over time. However, in practice a person will accept the demand for separation over time.Most classical inventory models assumed that the utility of the inventory remains constant during the period of their storage. But in real life, degradation occurs during the storage period. The deterioration of physical objects is a common phenomenon in the real world that can occur for various reasons and has attracted a lot of attention from various researchers.In recent years, the problem of inventory worsening has received considerable attention. Most products such as medicine, blood, fish, alcohol, gasoline, vegetables, and radioactive chemicals have self-life, and once spoiled they begin to deteriorate. The listed researchers, above, have taken care of deteriorating objects in their models and have developed models accordingly. In addition to inventory deterioration, limited storage is also a major practical problem for real life.Due to lack of large storage space at important market places, one should be forced to own a small ware-

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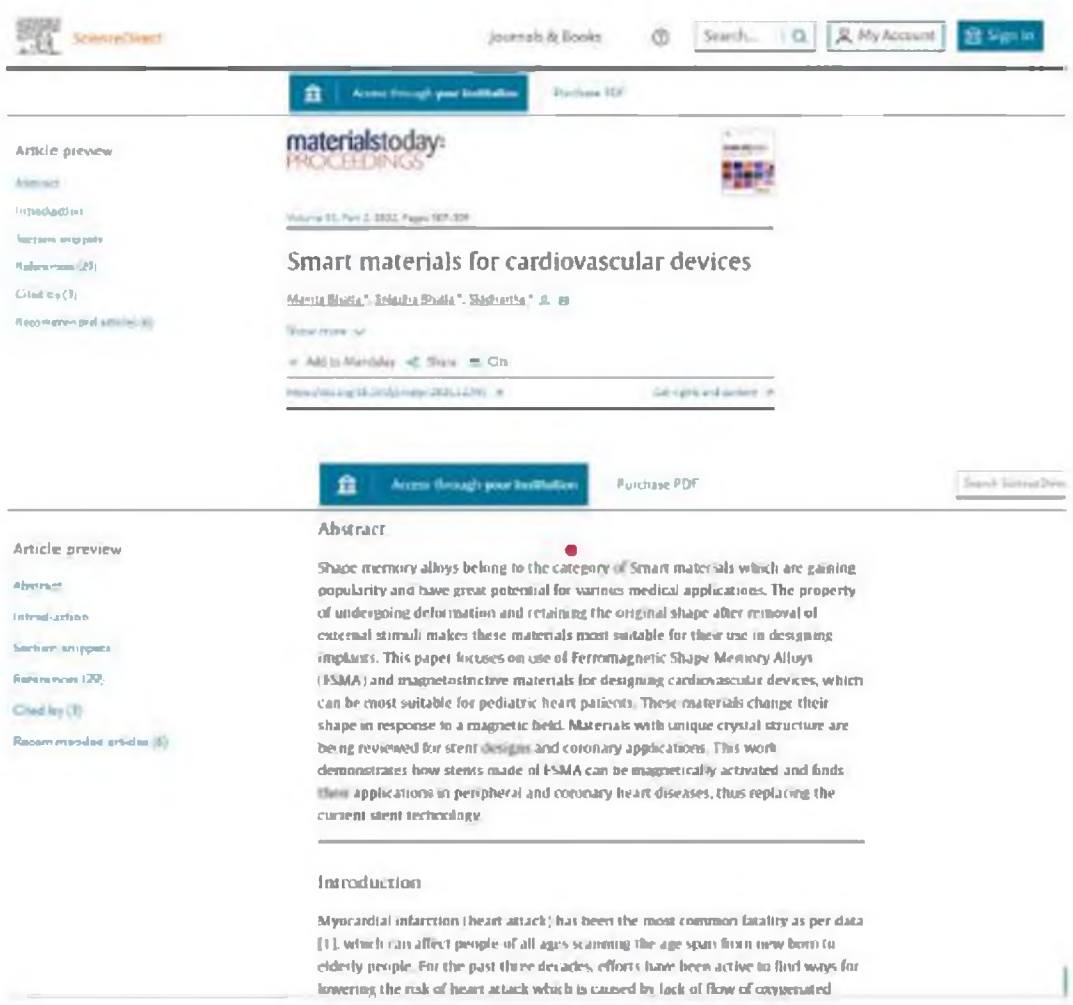
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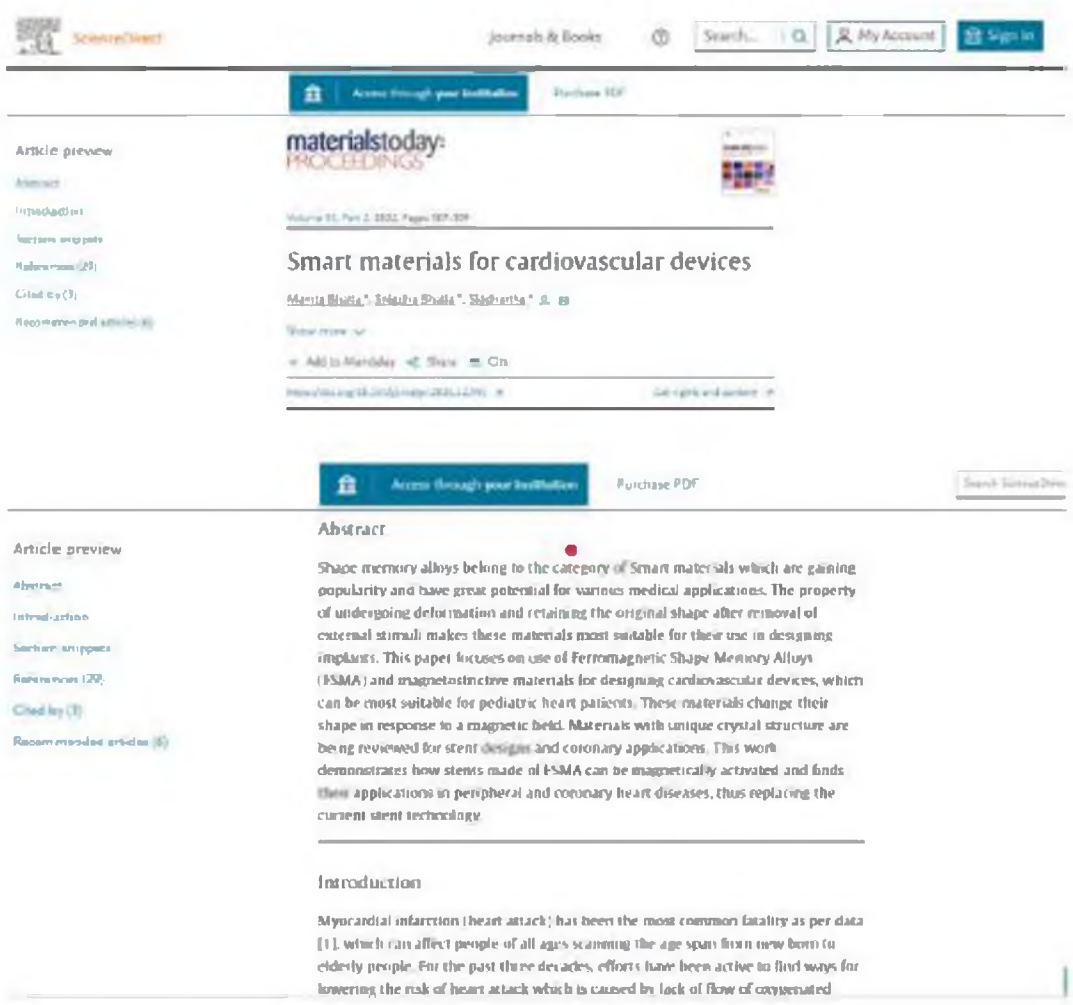
Abstract
Shape memory alloys belong to the category of Smart materials which are gaining popularity and have great potential for various medical applications. The property of undergoing deformation and retaining the original shape after removal of external stimuli makes these materials most suitable for their use in designing implants. This paper focuses on use of Ferromagnetic Shape Memory Alloys (FSMA) and magnetostrictive materials for designing cardiovascular devices, which can be most suitable for pediatric heart patients. These materials change their shape in response to a magnetic field. Materials with unique crystal structure are being reviewed for stent designs and coronary applications. This work demonstrates how stents made of FSMA can be magnetically activated and finds their applications in peripheral and coronary heart diseases, thus replacing the current stent technology.
Introduction
Myocardial infarction (heart attack) has been the most common fatality as per data [1], which can affect people of all ages scanning the age span from new born to elderly people. For the past three decades, efforts have been active to find ways for lowering the risk of heart attack which is caused by lack of flow of oxygenated



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Abstract

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Abstract
Present work reports the growth of BFO/WO3 bilayer thin film structures over Silicon, corning and ITO coated glass substrates. BFO layer in BFO/WO3 bilayer structure was deposited using Pulsed Laser deposition (PLD) technique at optimized laser energy (200 mJ) while WO3 nanostructured layer was deposited using rf-magnetron sputtering technique at varying glancing angle from 65° to 80°. For the realization of MBM (metal b layer-metal) device, top Gold (Au) electrodes have been deposited using thermal evaporation technique. The BFO/WO3 bilayer structure fabricated at 70° glancing angle exhibited the saturation (Ps) and remnant (Pr) polarization as 45.45 μC/cm2 and 21.52 μC/cm2 respectively, which are appreciably higher than the earlier reports for pure BFO thin films. Enhanced energy storage characteristics were obtained in Au/BFO/WO3/ITO structure fabricated at 70° glancing angle with charge-discharge efficiency (63%) and enlarged recoverable energy density (467 mJ/cm3). Achieved results indicate the utilization of fabricated Au/BFO/WO3/ITO structures towards high energy storage applications.
Volume 5, Issue 3
Special Issue: Special Issue on "Progress in Advanced Energy Storage Materials"
March 2023
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REFERENCES

Double quantum ionization cross-sections for more general exponential cosine screened coulomb potential

Rachna Joshi

Abstract

Double-quantum ionization cross-sections for hydrogen atom have been calculated for the more general exponential cosine screened coulomb (MGECSC) potential. The ionization cross-sections are calculated as a function of the wavelength of the incident photons, as well as the potential parameters, μ, b and c, using linearly and circularly

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Keywords: Double-quantum ionization, hydrogen atom, MGECSC potential

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Micrometre double-quantum ionization of Rydberg hydrogen using linearly and circularly polarized light

Rachna Arya

The European Physical Journal D 76, Article number: 37 (2022) | Cite this article

Abstract

Double-quantum ionization for Rydberg hydrogen is studied. The variation of ionization rates with wavelength is shown for linearly polarized (LP) and circularly polarized (CP) radiations. For performing the infinite summations over the intermediate states, pseudostate summation technique (PST) is used which is fast and efficient. Presently, the numerical values of two-quantum and three-quantum ionization rates from ground state and metastable 2s state only are available in the literature. The present work reports the calculations for the double-quantum ionization rates from higher excited levels of hydrogen. Numerical data is also presented for comparison with future experiments.

Graphical abstract


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High harmonic generation spectra for lithium embedded in plasma environment
Abstract
Effect of plasma on High harmonic generation of Lithium is investigated. Variation of the strength of different harmonics with respect to changes in Debye length is shown. The unperturbed energy eigenvalues and wavefunctions are calculated using the pseudostate summation technique while for the time evolution of wavefunctions the symplectic method is applied. Results for the numerical simulation of High harmonic generation spectra for plasma embedded Lithium are reported.
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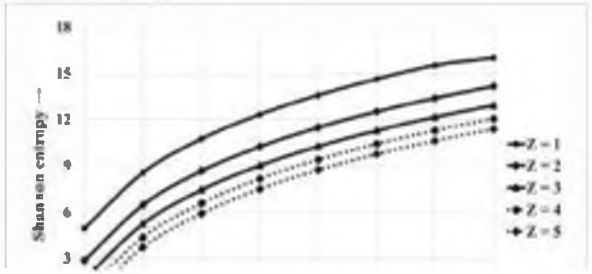
A numerical evaluation of Shannon entropy for modified Hulthen potential

Abstract

We calculate Shannon entropy for Modified Hulthen potential (MHP). Dependence of Shannon entropy on various parameters of the potential is investigated. For solving Schrodinger equation, i.e., for calculation of the wavefunctions, Numerov method has been employed which is fast and efficient. Numerical simulation is performed for the purpose. Novel data for Shannon entropy is presented for a wide range of the parameters of MHP.

Graphical abstract



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Favourable tuning of optical absorbance, bandgap and surface roughness of ZnO thin films by C ion implantation at the critical angle

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ARTICLE INFO

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Low energy ion implantation
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Thin film
Band gap
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Surface roughness

ABSTRACT

Low energy ion implantation with exquisite control of angle allows manipulating the applications of thin films. Here we present a favourable and efficient strategy of 50 keV Carbon ion implantations on ZnO thin films at three different tilt angles 0°, 30° and 60°. This plays a significant role in tuning of optical absorbance, bandgap, grain size and surface roughness simultaneously. The TRIM simulations are performed to elucidate the theoretical understanding and to compare the modifications in the physical properties using different characterization tools. These experimental results demonstrate that the ion implantations at 30° result in a significant reduction of 89% in the grain size and 35% reduction in the optical transmittance along with an improvement of 25% in the surface roughness of these thin films. The optical bandgap is also tuned from 3.27 to 3.20 eV. These results establish a new approach in designing the exotic materials with lower grain size, lower bandgap and smoother surface along with higher absorbance of ultraviolet (UV) light that will help increasing the data storage capacity and getting higher energy efficiency with reduced UV light emissions.

1. Introduction

The role of ion implantations has been extensively investigated for the applications in electronics industry and now these are being employed in the nano-structuring and nano-patterning in the semiconductors such as Si, Ge, etc. [1] The energetic incident ions transfer their kinetic energy and momentum to the host atoms which result in the atomic mass redistributions and cascade collisions at the surface of materials. This leads to the surface modifications and the nano-patterning of vivid types [2–7]. In general, structural, optical and magnetic changes are induced by the ion implantations due to the variation in the ion fluence and the energy [8–11]. ZnO thin films are selected due to their excellent metal-oxide material properties and as these have a large probability of intrinsic defects like Oxygen vacancy (V_O) and Zinc vacancy (V_{Zn}) in the surface or volume. The implantation of p-type non-metals like C, N, B, P and Si into ZnO has been found to improve the characteristic properties [12]. There are other advantages with this material such as higher exciton binding energy (approximately 60 meV) along with high tolerance for radiation and wide direct bandgap energy (up to 3.37 eV). This material is selected mostly for scientific research and also for industrial applications [13,14], which have led to the development of promising technologies based on engineering and control of their important and useful physical properties. Various metal and non-metal ion irradiations at high energy (hundreds of MeV) and ion implantations at low energy (tens of keV) at different angles have been performed mainly for generating the ripples on the surfaces. Buddhi et al. [15] have reported that the formation of nano-ripples on gold surfaces is possible by 30 keV Ar cluster ion beam bombardment at different angles. Further, it has also been confirmed using atomic force microscopy (AFM) that the maximum roughness of the gold surface is obtained at an incident angle of 60°. A significant mass redistribution was found by Ar ion beam bombardment at room temperature that led to the formation of nano-ripples on the surface. In the case of off-normal incidence, the target atoms receive the energy from the ions and move in the forward direction. As per the scientific reports, the ion incidence at a grazing angle removes the surface atoms in a very effective manner and smoothens the surface of the thin films without any erosion. Since 1972, ZnO and TiO_2 have been found to have outstanding sustainability and photocatalytic performances because of which these materials are being widely explored [16–18]. ZnO has a bandgap of about 3.24 eV and ultraviolet (UV) light will be required to start the photocatalytic reactions. In general, only 5% UV light can be

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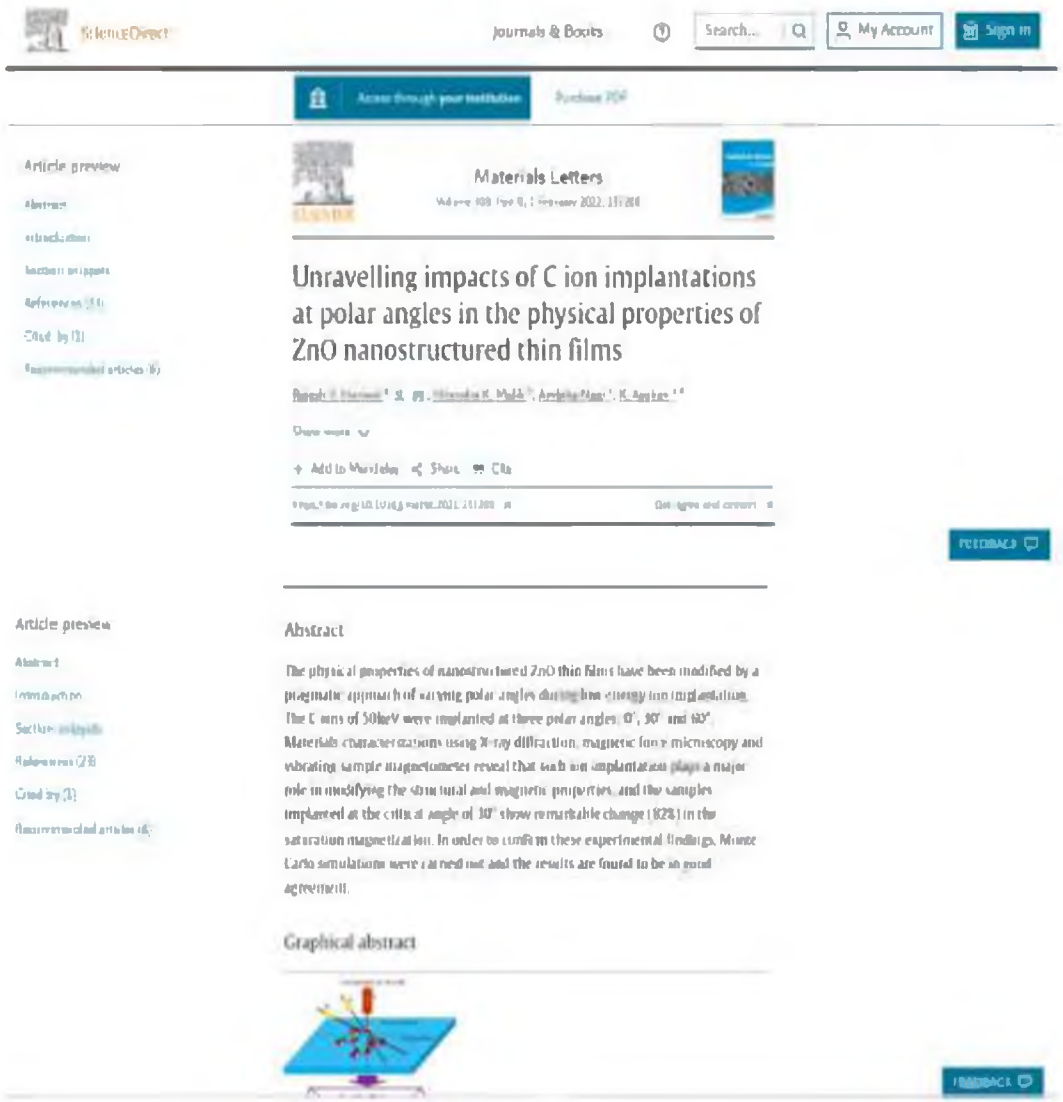

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Unravelling impacts of C ion implantations at polar angles in the physical properties of ZnO nanostructured thin films

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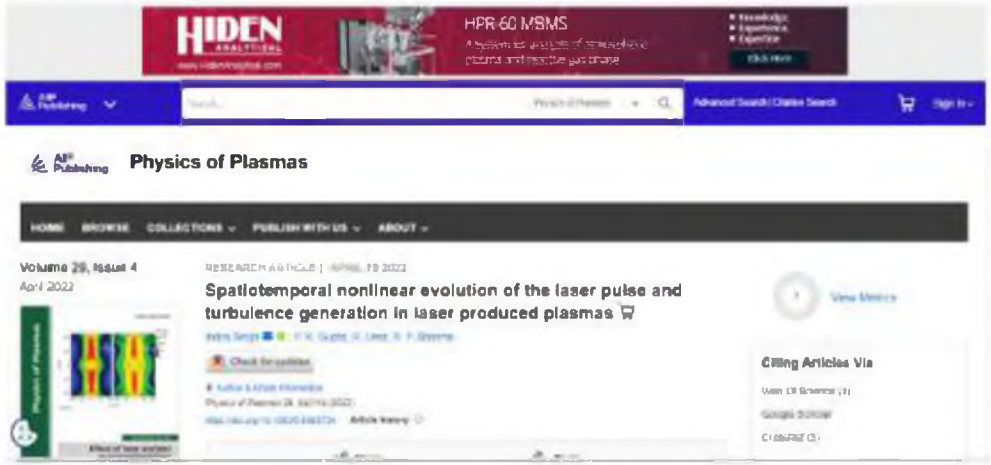
Abstract

The physical properties of nanostructured ZnO thin films have been modified by a pragmatic approach of varying polar angles during low energy ion implantation. The C ions of 50keV were implanted at three polar angles 0°, 30° and 60°. Materials characterizations using X-ray diffraction, magnetic force microscopy and vibrating sample magnetometer reveal that such an implantation plays a major role in modifying the structural and magnetic properties, and the samples implanted at the critical angle of 30° show remarkable change (82%) in the saturation magnetization. In order to confirm these experimental findings, Monte Carlo simulations were carried out and the results are found to be in good agreement.

Graphical abstract



Physics of Plasmas 29, 042114 (2022)

This study presents a model to understand the behavior of the turbulence generated in the magnetic field of mega gauss order during high-intensity laser interaction with magnetized plasma. The modified nonlinear Schrodinger (MNLS) equation is developed by contemplating the effect of the group velocity dispersion, diffraction, and nonlinearity induced by the relativistic variation of electron mass and the nonlinear ponderomotive force. Numerical simulation is carried out to solve the dimensionless MNLS equation. The simulation results show the generation of the solitary wave type coherent structures in the nonlinear spatiotemporal evolution of the laser pulse at the early stage, but subsequent turbulence generation has also been observed. The ensemble-averaged turbulent power spectrum has been studied and the power-law scaling is approximately $\sim k^{-1.45}$ (a solid red line of scaling $k^{-1.86}$ is given for reference). To get insight into the spatiotemporal nonlinear development of the laser pulse while propagating in the plasma medium, a semi-analytical model has also been presented. The present study could be substantial in replicating astrophysical scenarios by laboratory simulations along with understanding the underlying quintessential physics of magnetic turbulence.

Topics

Dielectric properties, Dispersion, Laboratory procedures, Ponderomotive force, Analytical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Abstract
Pure CdO nanostructured thin films and Ag doped with 1.0, 2.0 and 4.0wt% doping concentrations were fabricated successfully on glass substrates with a cost-effective spin coating technique. The prepared films exhibit a cubic crystal structure oriented along (111) plane. The surface morphology of the pure CdO films shows a cauliflower shape structure, becomes granular and compact at high Ag doping concentration. Raman spectra of the films reveal (LO (longitudinal optical) and TO (transverse optical) vibration modes at 406.80cm^{-1} and 566.54cm^{-1}. The absorption of the films significantly varies with Ag doping concentrations and as a result, the electronic structure of the films is tailored. Moreover, the optical band gaps vary in the range of 1.42–1.70eV. In addition, the optical parameters n, k were studied in correlation with Ag doping concentrations. The obtained room temperature photoluminescence spectra of the prepared films show a broad peak at ~350nm. The third order nonlinear optical parameters of the films were also examined systematically.

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Reversion of CYP450 monooxygenase-mediated acetamiprid larval resistance in dengue fever mosquito, *Aedes aegypti* L.

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Research Paper

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Keywords:
Acetamiprid; *Aedes aegypti*; monooxygenases; PBO; resistance; synergism

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Abstract

Aedes-borne diseases are on the rampant rise despite continued application of chemical insecticide-based interventions. The appearance of high degree of insecticide resistance in *Aedes* species and noxious effects on environment and non-targets have raised further concerns. Among new chemical interventions, neonicotinoids are considered a safe and effective approach. The present study investigated the control potency of acetamiprid and development of resistance in *Aedes aegypti* larvae; and the involvement of CYP450 monooxygenases in inducing resistance. The early fourth instars of *Ae. aegypti* parent susceptible strain (PS) were selected with acetamiprid for 15 generations (ACSF strain) increasing the resistance to 19.74-fold in ACSF-10 and 36.71-fold in ACSF-15. The ACSF-10 larvae were assayed with acetamiprid combined with piperonyl butoxide (PBO) in three different ratios (1:1, 1:5 and 1:10) and selected for next five generations with 1:10 combination. Selection with synergized acetamiprid (APSF strains) reversed as well as reduced the rate of resistance development resulting in only 1.35-fold resistance in APSF-15. The APSF strains showed %monooxygenase dependency ranging from 86.71 to 96.72%. The estimation of the monooxygenases levels in parent and selected larvae showed increased monooxygenase level in the ACSF strains by 2.42–2.87-fold. The APSF-15 strains exhibited 57.95% lower enzyme production than ACSF-15 strain. The reduction and reversion of resistance by using PBO and the elevated levels of monooxygenases in ACSF and reduction in APSF strains recommend the involvement of CYP450-mediated mechanism in the development of acetamiprid resistance in *Ae. aegypti*. These studies could help in devising resistance management strategies in order to preserve the efficiency of pre-existing insecticides.

Introduction

Aedes aegypti L. is a widespread mosquito responsible for the transmission of ever-increasing infections causing extensive though variable degree of health hazards in the world, especially in tropical and sub-tropical regions. In several countries, *Aedes*-borne disease, dengue, has become a principal health concern due to worrisome rise to 390 million annual dengue infections with 96 million clinical manifestations (Bhatt *et al.*, 2013). India has recorded a total of 39,419 dengue cases and 56 deaths in year 2020 and 39,419 suspected cases of Chikungunya (NVBDCP, 2021*a*, 2021*b*).

In the absence of vaccines and adequate medication, mosquito-borne diseases are primarily kept under check *via* mosquito management, at larval as well as adult stage. The traditional ways of interventions, such as use of mosquito bed nets, window screens, etc., are still in practice widely. Yet, application of chemical-based measures is on rampant rise to manage complicated-resistant mosquitoes quickly and effectually (Liu *et al.*, 2006; Kumar *et al.*, 2009). Various groups of chemical toxicants have been used against mosquitoes; however, the negative impact of these on the surroundings, and non-target organisms along with the appearance of high insecticide resistance levels among mosquitoes has caused concerns (Bonner *et al.*, 2007; Moore *et al.*, 2009). Several countries have reported insecticide resistance in *Ae. aegypti*, including India (Kushwah *et al.*, 2015), Brazil (Lima *et al.*, 2011), China (Li *et al.*, 2015), Colombia (Fonseca-Gonzalez *et al.*, 2011), Malaysia (Ishak *et al.*, 2015) and Thailand (Yanola *et al.*, 2011); and revealed metabolic detoxification and decreased sensitivity of insecticide-target proteins as the prime cause for the resistance (Bansal *et al.*, 2012; Yang and Liu, 2014).

Among the new approaches and chemical interventions, neonicotinoids, synthetic derivatives of nicotine, are one of the fastest-growing insecticides and considered a safe replacement of the conventional insecticides currently used in the mosquito management. These chemicals induce toxicity in the target insect pest by interacting with nicotinic acetylcholine receptors (nAChRs) of the insect nervous system mediating fast cholinergic transmission (Li *et al.*, 2012). Acetamiprid, a neonicotinoid, reacts with nAChRs located in the post-synaptic neural

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Sarita Kumar, Email: sarita.sanjay90@gmail.com; saritakumar@andc.du.ac.in

Abstract

Aedes-borne diseases are on the rampant rise despite continued application of chemical insecticide-based interventions. The appearance of high degree of insecticide resistance in *Aedes* species and noxious effects on environment and non-targets have raised further concerns. Among new chemical interventions, neonicotinoids are considered a safe and effective approach. The present study investigated the control potency of acetamiprid and development of resistance in *Aedes aegypti* larvae; and the involvement of CYP450 monooxygenases in inducing resistance. The early fourth instars of *Ae. aegypti* parent susceptible strain (PS) were selected with acetamiprid for 15 generations (ACSF strain) increasing the resistance to 19.74-fold in ACSF-10 and 36.71-fold in ACSF-15. The ACSF-10 larvae were assayed with acetamiprid combined with piperonyl butoxide (PBO) in three different ratios (1:1, 1:5 and 1:10) and selected for next five generations with 1:10 combination. Selection with synergized acetamiprid (APSF strains) reversed as well as reduced the rate of resistance development resulting in only 1.35-fold resistance in APSF-15. The APSF strains showed %monooxygenase dependency ranging from 86.71 to 96.72%. The estimation of the monooxygenases levels in parent and selected larvae showed increased monooxygenase level in the ACSF strains by 2.42–2.87-fold. The APSF-15 strains exhibited 57.95% lower enzyme production than ACSF-15 strain. The reduction and reversion of resistance by using PBO and the elevated levels of monooxygenases in ACSF and reduction in APSF strains recommend the involvement of CYP450-mediated mechanism in the development of acetamiprid resistance in *Ae. aegypti*. These studies could help in devising resistance management strategies in order to preserve the efficiency of pre-existing insecticides.

Introduction

Aedes aegypti L. is a widespread mosquito responsible for the transmission of ever-increasing infections causing extensive though variable degree of health hazards in the world, especially in tropical and sub-tropical regions. In several countries, *Aedes*-borne disease, dengue, has become a principal health concern due to worrisome rise to 390 million annual dengue infections with 96 million clinical manifestations (Bhatt *et al.*, 2013). India has recorded a total of 39,419 dengue cases and 56 deaths in year 2020 and 39,419 suspected cases of Chikungunya (NVBDCP, 2021*a*, 2021*b*).

In the absence of vaccines and adequate medication, mosquito-borne diseases are primarily kept under check *via* mosquito management, at larval as well as adult stage. The traditional ways of interventions, such as use of mosquito bed nets, window screens, etc., are still in practice widely. Yet, application of chemical-based measures is on rampant rise to manage complicated-resistant mosquitoes quickly and effectually (Liu *et al.*, 2006; Kumar *et al.*, 2009). Various groups of chemical toxicants have been used against mosquitoes; however, the negative impact of these on the surroundings, and non-target organisms along with the appearance of high insecticide resistance levels among mosquitoes has caused concerns (Bonner *et al.*, 2007; Moore *et al.*, 2009). Several countries have reported insecticide resistance in *Ae. aegypti*, including India (Kushwah *et al.*, 2015), Brazil (Lima *et al.*, 2011), China (Li *et al.*, 2015), Colombia (Fonseca-Gonzalez *et al.*, 2011), Malaysia (Ishak *et al.*, 2015) and Thailand (Yanola *et al.*, 2011); and revealed metabolic detoxification and decreased sensitivity of insecticide-target proteins as the prime cause for the resistance (Bansal *et al.*, 2012; Yang and Liu, 2014).

Among the new approaches and chemical interventions, neonicotinoids, synthetic derivatives of nicotine, are one of the fastest-growing insecticides and considered a safe replacement of the conventional insecticides currently used in the mosquito management. These chemicals induce toxicity in the target insect pest by interacting with nicotinic acetylcholine receptors (nAChRs) of the insect nervous system mediating fast cholinergic transmission (Li *et al.*, 2012). Acetamiprid, a neonicotinoid, reacts with nAChRs located in the post-synaptic neural

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Research Article

Attractive Sugar Bait Formulation for Development of Attractive Toxic Sugar Bait for Control of *Aedes aegypti* (Linnaeus)

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Background. Attractive toxic sugar bait (ATSB), based on "attract and kill" approach, is a novel and promising strategy for mosquito control. Formulation of an attractive sugar bait (ASB) solution by selecting an efficient olfaction stimulant and preparation of an optimized sugar-attractant dosage is a significant component for the success of the approach. *Methods.* Current study evaluated relative potential of nine ASBs, formulated by combination of sugar and fresh fruit juices (guava, mango, muskmelon, orange, papaya, pineapple, plum, sweet lemon, and watermelon) in attracting *Aedes aegypti* adults. Freshly extracted and 48-hour-fermented juices were combined with 10% sucrose solution (w/v) in 1 : 1 ratio. Cage bioassays were conducted against two laboratory strains (susceptible: AND-*Aedes aegypti*; deltamethrin-selected: AND-*Aedes aegypti*-DL10) and two field-collected strains (Shahdara strain of *Aedes aegypti*: SHD-Delhi; Govindpuri strain of *Aedes aegypti*: GVD-Delhi). Each of the nine ASBs was assayed, individually or in groups of three, for its attraction potential based on the relative number of mosquito landings. The data were analysed for statistical significance using PASW (SPSS) software 19.0 program. *Results.* The prescreening bioassay with individual ASB revealed significantly higher efficacy of ASB containing guava/plum/mango juice than that containing six other juices ($p < 0.05$) against both the laboratory and field strains. The bioassay with three ASBs kept in one cage, one of the effective ASBs and two others randomly selected ASBs, also showed good attractancy of the guava/plum/mango juice-ASB ($p < 0.05$). The postscreening assays with these three ASBs revealed maximum attractant potential of guava juice-sucrose combination for all the four strains of *Ae. aegypti*. *Conclusion.* Guava juice-ASB showed the highest attractancy against both laboratory and field-collected strains of *Ae. aegypti* and can be used to formulate ATSB by combining with a toxicant. The field studies with these formulations will ascertain their efficacy and possible use in mosquito management programs.

1. Introduction

Aedes aegypti (Linnaeus) is the major insect disease vector for transmitting viral diseases, dengue, yellow fever, Chikungunya, and Zika [1]. In 2019, the largest number of dengue cases (5.2 million) were ever reported worldwide affecting all WHO regions [2]. Since the use of chemical-based control interventions is associated with environmental concerns, there is a need for natural and environmentally safe interventions [3].

Insecticide-laced attractive toxic sugar bait (ATSB) is considered a new mosquito control method based on the feeding behaviour of mosquitoes [4]. The mosquitoes feed on plant sugars (sucrose and fructose), nectar, honeydew, etc., as a source of energy for their nutrition and survival [5] and use visual and olfaction cues to locate flowers and fruits [6]. Sugar-seeking mosquitoes are attracted by the volatile components of fruits and flowers [7], damaged and rotted fruits [8], and various fruits, edible seeds, flowers, and insect honeydew [9]. Thus, a combination of sugar, an attractant

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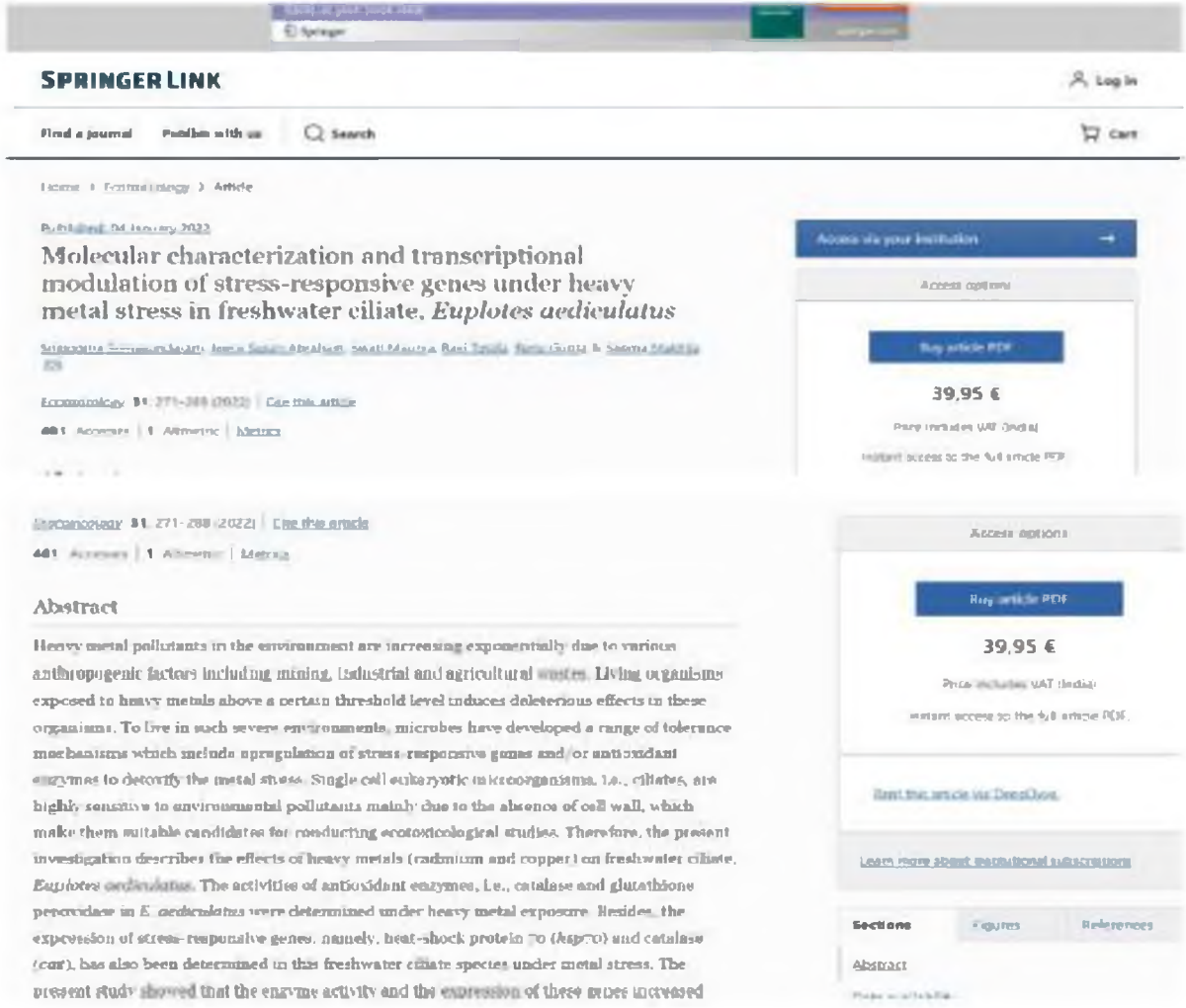
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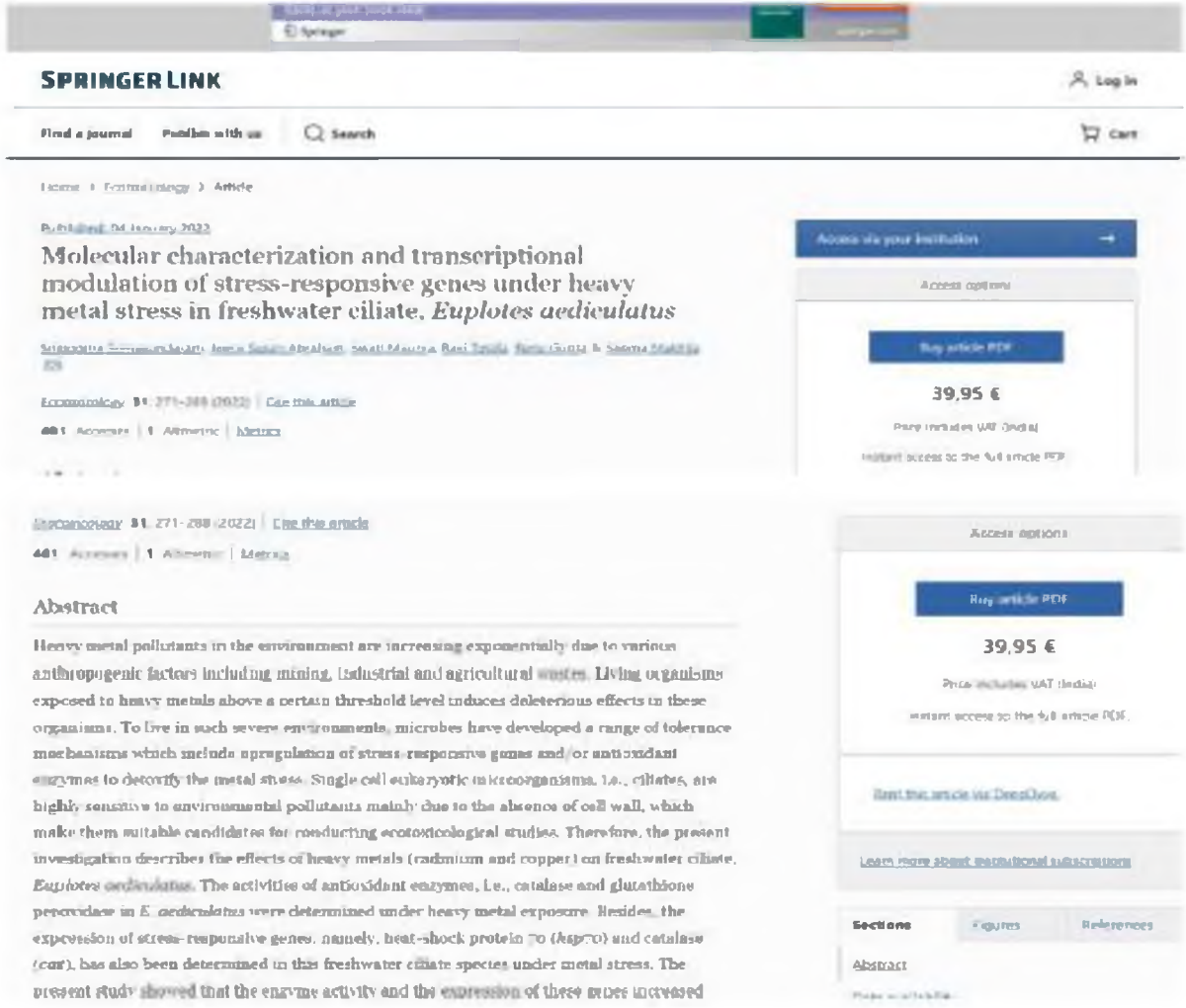
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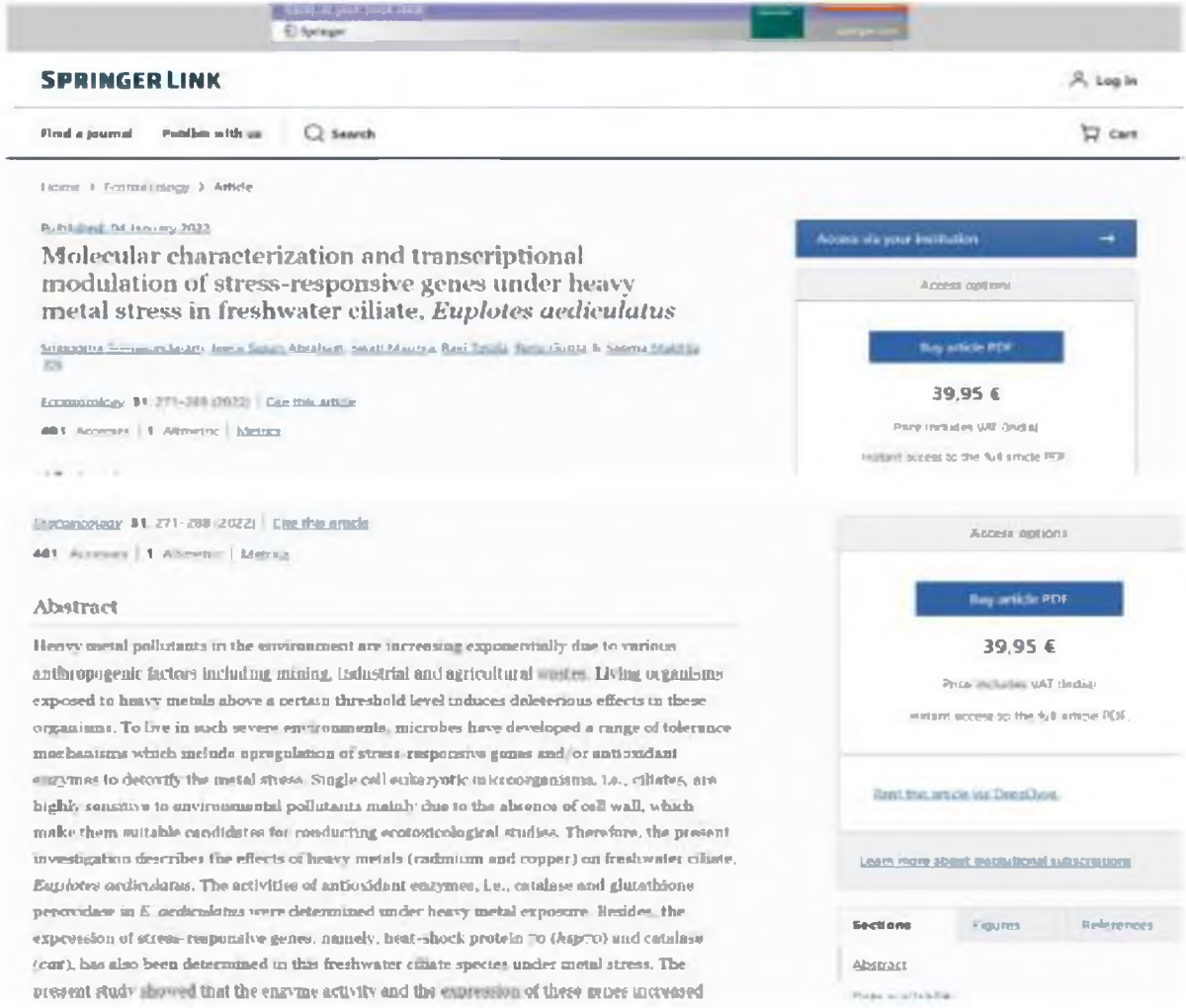
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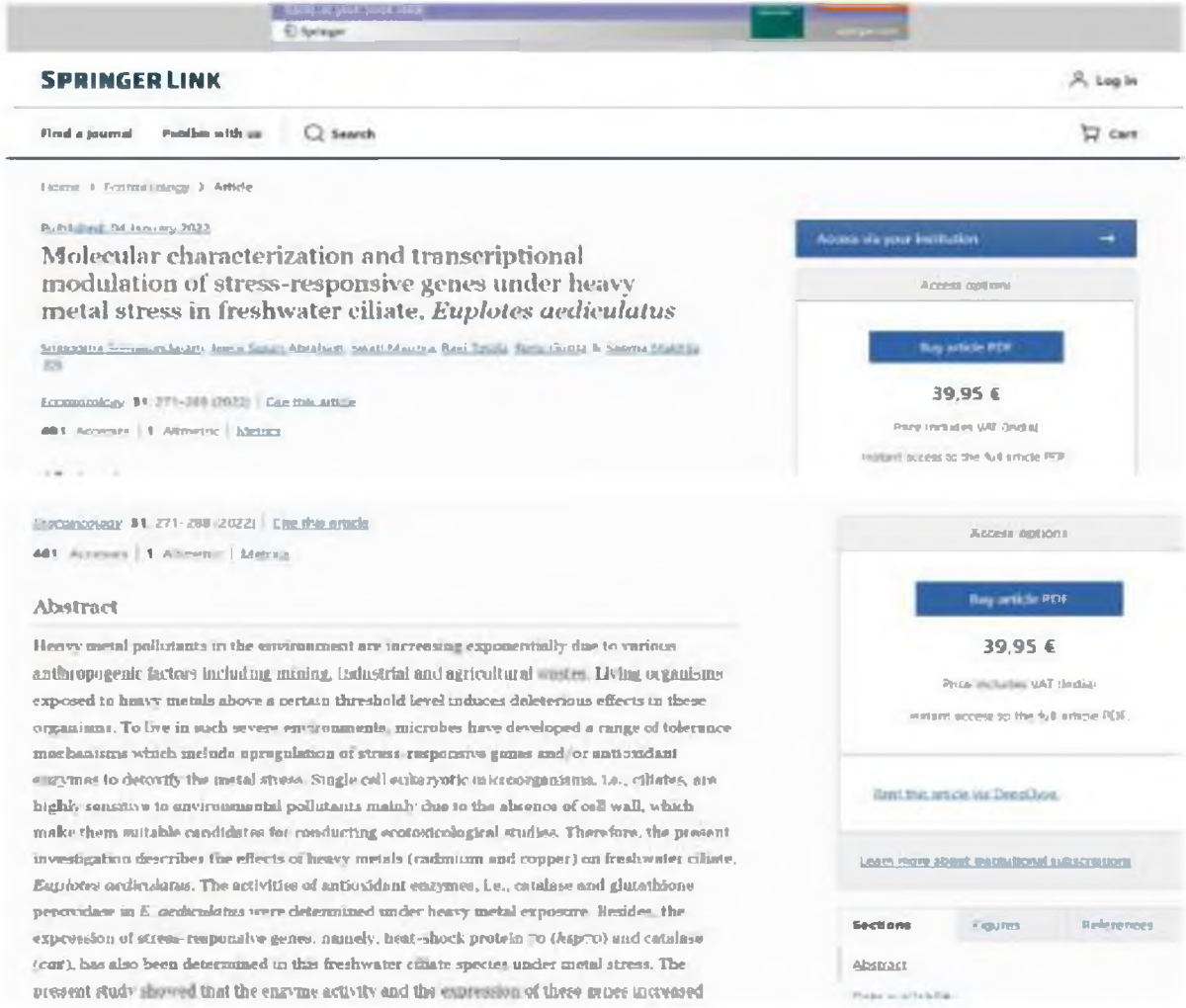
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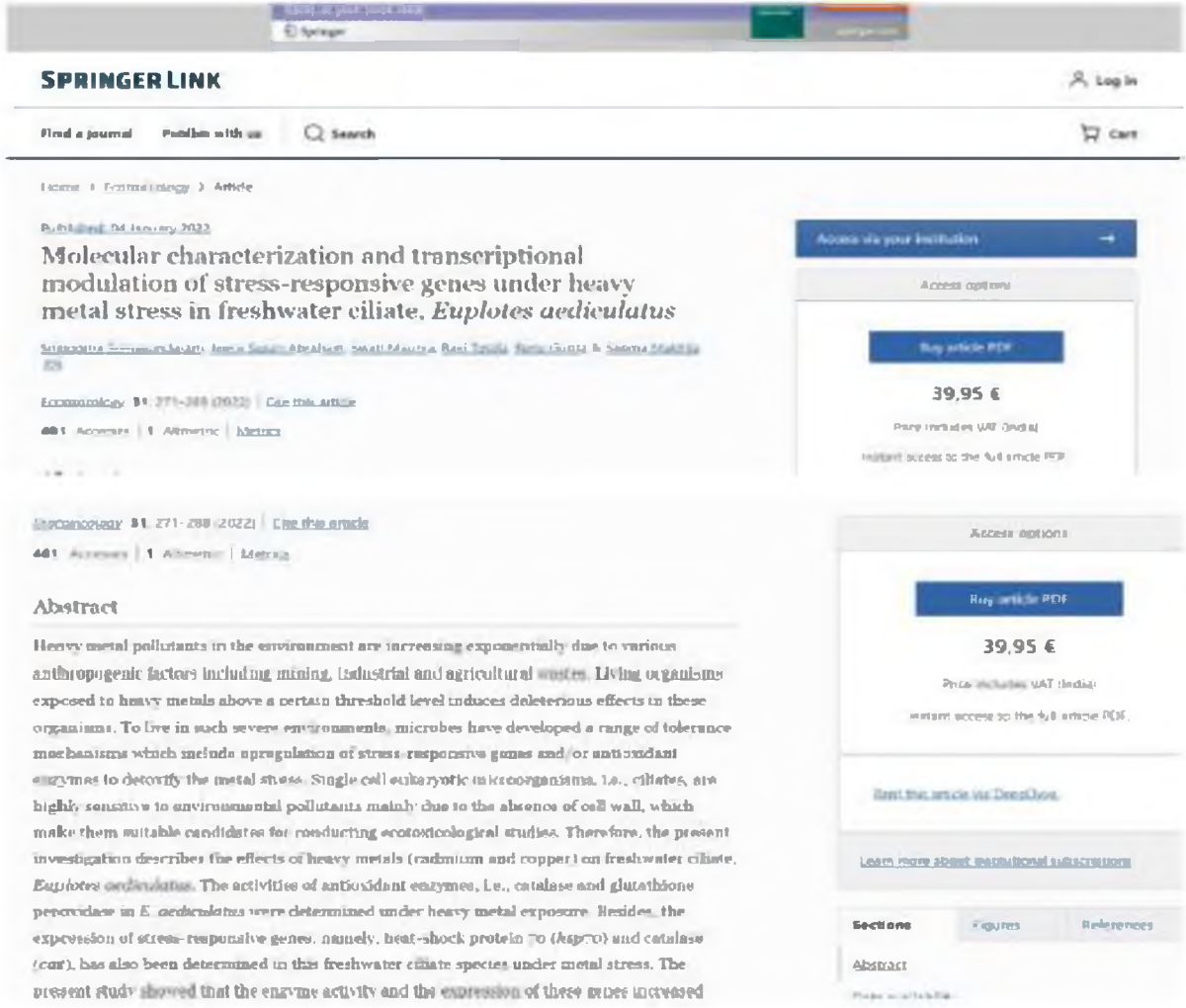
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REVIEW ARTICLE

Microbial Journey: Mount Everest to Mars

Utkarsh Sood[1] · Gauri Garg Dhingra[2] · Shailly Anand[3] · Princy Hira[4] · Roshan Kumar[5] · Jasvinder Kaur[6] · Mansi Verma[7] · Nirjara Singhvi[8] · Sukanya Lal[9] · Charu Dogra Rawat[9] · Vineet Kumar Singh[10] · Jaspreet Kaur[4] · Helianthous Verma[9] · Charu Tripathi[11] · Priya Singh[4] · Ankita Dua[12] · Anjali Saxena[13] · Rajendra Phartyal[7] · Perumal Jayaraj[7] · Seema Makhija[10] · Renu Gupta[4] · Sumit Sahni[10] · Namita Nayyar[7] · Jeeva Susan Abraham[10] · Sripoorna Somasundaram[10] · Pushp Lata[9] · Renu Solanki[3] · Nitish Kumar Mahato[14] · Om Prakash[15] · Kiran Bala[16] · Rashmi Kumari[17] · Ravi Toteja[10] · Vipin Chandra Kalia[18] · Rup Lal[1]

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Abstract A rigorous exploration of microbial diversity has revealed its presence on Earth, deep oceans, and vast space. The presence of microbial life in diverse environmental conditions, ranging from moderate to extreme temperature, pH, salinity, oxygen, radiations, and altitudes, has provided the necessary impetus to search for them by extending the limits of their habitats. Microbiology started as a distinct science in the mid-nineteenth century and has provided inputs for the betterment of mankind during the last 150 years. As beneficial microbes are assets and pathogens are detrimental, studying both have its own merits. Scientists are nowadays working on illustrating the microbial dynamics in Earth's subsurface, deep sea, and polar regions. In addition to studying the role of microbes in the environment, the microbe-host interactions in humans, animals and plants are also unearthing newer insights that can help us to improve the health of the host by modulating the microbiota. Microbes have the potential to remediate persistent organic pollutants. Antimicrobial resistance which is a serious concern can also be tackled only after monitoring the spread of resistant microbes using disciplines of genomics and metagenomics The cognizance of microbiology has reached the top of the world. Space Missions are now looking for signs of life on the planets (specifically Mars), the Moon and beyond them. Among the most potent pieces of evidence to support the existence of life is to look for microbial, plant, and animal fossils. There is also an urgent need to deliberate and communicate these findings to layman and policymakers that

Utkarsh Sood and Gauri Garg Dhingra have contributed equally to this work.

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Abstract A rigorous exploration of microbial diversity has revealed its presence on Earth, deep oceans, and vast space. The presence of microbial life in diverse environmental conditions, ranging from moderate to extreme temperature, pH, salinity, oxygen, radiations, and altitudes, has provided the necessary impetus to search for them by extending the limits of their habitats. Microbiology started as a distinct science in the mid-nineteenth century and has provided inputs for the betterment of mankind during the last 150 years. As beneficial microbes are assets and pathogens are detrimental, studying both have its own merits. Scientists are nowadays working on illustrating the microbial dynamics in Earth's subsurface, deep sea, and polar regions. In addition to studying the role of microbes in the environment, the microbe-host interactions in humans, animals and plants are also unearthing newer insights that can help us to improve the health of the host by modulating the microbiota. Microbes have the potential to remediate persistent organic pollutants. Antimicrobial resistance which is a serious concern can also be tackled only after monitoring the spread of resistant microbes using disciplines of genomics and metagenomics The cognizance of microbiology has reached the top of the world. Space Missions are now looking for signs of life on the planets (specifically Mars), the Moon and beyond them. Among the most potent pieces of evidence to support the existence of life is to look for microbial, plant, and animal fossils. There is also an urgent need to deliberate and communicate these findings to layman and policymakers that

Utkarsh Sood and Gauri Garg Dhingra have contributed equally to this work.

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A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the Landfill and the Soil from the Human Inhabitant Land
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Landfilling is considered to be a safe and economical approach for waste disposal but this is true only for engineered landfills. Engineered landfills are seldom found in developing countries like India. The generation of leachate from the landfilled municipal solid waste (MSW) is a major concern nowadays. Leachate is the result of two main phenomena occurring in a landfill: infiltration of water in the deposited waste mass and mass transfer of substances from waste to infiltrating water. This leachate can cause severe environmental degradation and also pollute natural resources like soil and soil microbes. In the present study, the physical and chemical parameters and ciliate diversity of leachate contaminated soil from the Okhla landfill (Okhla L) and non-contaminated soil from human inhabitant site Acharya Narendra Dev College (ANDC) were compared. It was observed that the physical and chemical parameters namely, water holding capacity, pH, electrical conductivity, calcium and magnesium, calcium carbonate, soil organic matter, nitrogen and cation exchange capacity of soil contaminated with leachate from Okhla L was found to be significantly different from the ANDC. The concentration of various heavy metals such as Co, Ni, Cu, Zn, Cd and Pb were
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DEGRADATION, REHABILITATION AND CONSERVATION OF SOILS | Published: 30 June 2022

A Comparative Study of Physical and Chemical Parameters and Ciliate Diversity of Leachate Contaminated Soil from the Landfill and the Soil from the Human Inhabitant Land

Eurasian Soil Science 55, 1161–1172 (2022) | Cite this article

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Nano LIFE | Vol. 12, No. 01, 2130011 (2022) | Review Paper
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of nanomaterials, such as nanogels, nanospheres, nanocapsules, liposomes, nanoparticles and many others, that have been investigated in vitro and in vivo for successful drug delivery, vaccination, diagnostic assay and device development with anticipation to be translated as advanced clinical practices, need a collective relook. This paper intends to contribute insightful critique of current studies on the efficacy of nanoplatforms as drug transporter, diagnostic tool and vaccine candidate against pathogenic viruses covering the highly pathogenic and noticeable "coronaviruses".
Key words: Nanotechnology • viruses • nanotherapeutics • nanovaccines • nanoparticles •
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Identification of perturbed pathways rendering susceptibility to tuberculosis in type 2 diabetes mellitus patients using BioNSi simulation of integrated networks of implicated human genes

JYOTI RANI[1,2], ANASUYA BHARGAV[2,3], SURABHI SETH[2,3], MALABIKA DATTA[3,4], URMI BAJPAI[1] and SRINIVASAN RAMACHANDRAN[2,3]*

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MS received 2 April 2022; accepted 24 August 2022

In type 2 diabetes mellitus (T2DM) patients, chronic hyperglycemia and inflammation underlie susceptibility to tuberculosis (TB) and result in poor TB control. Here, an integrative pathway-based approach is used to investigate perturbed pathways in T2DM patients that render susceptibility to TB. We obtained 36 genes implicated in type 2 diabetes-associated tuberculosis (T2DMTB) from the literature. Gene expression analysis on T2DM patient data (GSE26168) showed that *DEFA1* is differentially expressed at P_{adj}<0.05. The human host TB susceptibility genes *TNFRSF10A*, *MSRA*, *GPR148*, *SLC37A3*, *PXK*, *PROK2*, *REV3L*, *PGM1*, *HIST3H2A*, *PLAC4*, *LETM2*, and *EMP2* and hsa-miR-146a microRNA were also differentially expressed at P_{adj}<0.05. We included all these genes and added the remaining 28 genes from the T2DMTB set and the remaining differentially expressed genes at P_{adj}<0.05 in STRING and obtained a well-connected network with high confidence score (≥0.7). Further, we extracted the KEGG pathways at FDR<0.05 and retained only the diabetes and TB pathways. The network was simulated with BioNSi using gene expression data. It is evident from BioNSi analysis that the NF-kappa B and Toll-like receptor pathways are commonly perturbed with high ranking in multiple gene expression datasets of type 2 diabetes versus healthy controls. The other pathways, necroptosis pathway and FoxO signalling pathway, appear perturbed with high ranking in different gene expression datasets. These pathways likely underlie susceptibility to TB in T2DM patients.

Keywords. BioNSi; differential expression; simulation; text mining; tuberculosis; type 2 diabetes

1. Introduction

Patients with type 2 diabetes mellitus (T2DM) are reportedly at risk of acquiring tuberculosis (TB) (Chaudhry *et al.* 2012; Niazi and Kalra 2012; Kapur and Harries 2013). T2DM develops due to insulin resistance. It is on the rise, affecting an increasing number of people every year worldwide (Faurholt-Jepsen *et al.* 2011). The majority of diabetic patients are of T2DM type (Agarwal *et al.* 2016). Also, 10% of deaths due to TB cases are linked to diabetes in low- and middle-income countries (Faurholt-Jepsen *et al.* 2011). Drugs used to treat TB are reported to cause diabetes-associated conditions. Rifampicin reportedly

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Pharmacological Manipulation of UPR: Potential Antiviral Strategy Against Chikungunya Virus

Nishtha Agrawal, Sanjesh Saini, Madhu Khanna, Gagan Dhawan & Uma Dhawan

Indian Journal of Microbiology 62, 634–640 (2022) | Cite this article

220 Accesses | 1 Altmetric | Metrics

Abstract

Viruses invade the host cells and maneuver the cellular translation machinery to translate the viral proteins in substantial amounts, which may disturb Endoplasmic Reticulum homeostasis leading to induction of Unfolded Protein Response (UPR), a host response pathway involved in viral pathogenesis. Here, we investigated the effect of UPR pathways on the pathogenesis of chikungunya virus infection. We observed that chikungunya virus mediated the modulation of UPR. A positive modulation was observed in the activation of IRE1 and ATF6 branch while the PERK branch of UPR observed suppressed upon virus infection. We further investigated the effect of the inhibition of UPR pathways on chikungunya virus replication using inhibitors for each branch. Cells treated with 3-ethoxy-5,6-dibromosalicylaldehyde (IRE1 inhibitor) and AEBSF (ATF6 inhibitor) significantly inhibits the viral replication process. This study has provided a novel perspective in designing antivirals against chikungunya virus.

Graphical Abstract

Review Paper:

Realizing the New Reality: Machine Learning Curbing Antimicrobial Resistance in *Cutibacterium acnes*

Gupta Romasha[1], Dhawan Gagan[1], Kumar Bipul[1,2] and Gautam Hemant K.[1,2,3]*
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Abstract

Increase in antibiotic resistance is the current cause of global concern facing the human healthcare sector. Dermatologists, particularly face a major challenge, especially when treating acne due to the over-prescription of antibiotics. In an era of tremendous technological advancement, the need for the development of bioinformatics tools and the availability of public databases is the new holy grail to combat antibiotic resistance. With the emergence of machine learning approaches, screening of drug-resistant microbes and identification of known and novel resistant genes have been facilitated for the rapid development of drugs or techniques to combat the problem of resistance.

The whole-genome sequences of Cutibacterium acnes are stored digitally in the PATRIC database for research purposes. With the amalgamation of machine learning algorithms along with the availability of genomic sequences, the prediction of antimicrobial resistance is becoming a reality. The swift and accurate prediction of antibiotic resistance using machine learning tools and algorithms would lower the increasing rate of antibiotic resistance encountered in Cutibacterium acnes and will help dermatologists to combat the problem of Acne vulgaris more efficiently.

Keywords: Antimicrobial resistance, Machine learning, PATRIC database, Whole genome analysis.

Introduction

In recent times, the astronomical growth of antimicrobial-resistant (AMR) infections has become a matter of great concern exposing public health to innumerable threats. According to an estimate, AMR infections are causing around 70, 0000 deaths worldwide on an annual basis. It is also believed that this number will amount to 10 million per year by 2050[30].

Bacteria, which are considered as one of the oldest life forms existing on the earth, have mastered the artwork of evading detrimental conditions that threaten their existence. Selective mutations have empowered them to continue to exist for billions of years making them resistant to the available conventional antibiotics that are being used to treat infections caused by them. Over time, many causative organisms have become smarter and tailored themselves to dodge the medications designed to kill them, rendering the products less effective[26]. Since most bacteria, viruses and other microbes multiply expeditiously, they can quickly evolve and broaden resistance to antimicrobial drugs[10].

The rapid increase of use of antimicrobials readily available in the market is undoubtedly boosting antimicrobial resistance[16]. It is a common practice to administer antibiotics without professional oversight. For instance, it is commonly observed that people suffering from the common cold and flu-like conditions take medication on their own without proper prescription or consultation. An increase in antibiotic resistance is driven by an amalgamation of germs unveiled to antibiotics. Antibiotic resistance is not biased, rather it can affect any individual at any level of life irrespective of their gender and age[2].

Antibiotics are generally administered to cure an infection in the body, however, when the patients stop responding, it does not mean that the body is becoming resistant to antibiotics, rather it is the micro-organism that becomes resistant against the prescribed antibiotics to kill them. These factors lead to the emergence, spread and persistence of multidrug-resistant (MDR) bacteria, which are also referred to as "superbugs"[18,24]. The antibiotics prescribed by a physician against resistant bacteria will only increase the level of resistance and will delay the patient's recovery.

Acne, the most common chronic disease, is the result of abnormal sebaceous production inside pores and skin follicles[11,20]. This leads to abnormal keratinization inside the follicle resulting in a comedo formation. The inflammation process is then prompted and propagated with the aid of *Cutibacterium acnes*, a bacterium that infects the skin. Erythromycin, clindamycin and oral tetracyclines are the most frequently used antibiotics for the treatment of acne [33]. These antibiotics are known to inhibit the growth of bacteria (commonly known as bacteriostatic) rather than killing the bacteria (commonly known as bactericidal). Exposure to such bacteriostatic agents repeatedly results in the emergence of antibiotic-resistant strains of *Cutibacterium acnes* in recent times.

A complete genomic DNA sequence depicts the structural details of the individual traits of an organism or population. Microbial genome sequencing helps in detecting the antibiotic resistance for various pathogens and provides

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Upsurge in biomedical waste due to COVID-19 in India: A statistical correlation, challenges and recommendations

Ritu Khosla[1†], Ashima Jha[2†], Shweta Dua[3], Shivani G. Varmani[2*], Namita Rajput[4] and Balaram Pani[5]

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Proper management of Biomedical Waste (BMW) is an essential component of any sustainable healthcare sector. With the burst of COVID-19 pandemic when every hospital and treatment facility was overburdened patients, efficient handling of the huge amount of generated BMW became a task for the entire world. This review compares the BMW generated before and during the second wave of COVID-19, highlights the challenges in managing the exuberated amount of COVID-19 waste and sites recommendations to promote sustainable design thinking, in order to address this grave concern in the current setting of the Indian system. The study indicated that inappropriate management of waste and the lacunae in the entire chain from segregation to collection until its disposal has posed a serious threat to the wellbeing of healthcare workers, sanitation staff as well as the operators and housekeeping staff at the hospitals, isolation centers and Municipal Corporation. Many states had inadequate number of common BMW treatment facilities (CBMWTFs) leading to inefficient treatment of the excess waste. The behavioural and attitudinal barriers of neglect and ignorance of different stakeholders further aggravated the problem of BMW management to manifolds. To achieve better management we recommend spreading awareness regarding the kind and infectious nature of waste generated by COVID-19 patients and their caregivers, segregation and decontamination of such waste at source and increasing the capacity as well as number of CBMWTFs. Creative ways to recycle the waste must be devised so as to reduce the burden on disposal sites.

Keywords
COVID-19, biomedical waste, India, recommendations, challenges

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Evaluation of stigma receptivity and its properties in *Helianthus annuus* L. (Asteraceae)

B. Sharma, G. Kalra & H. Verma

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Abstract

Stigma receptivity has a critical role in the development of flowering plants. The time of stigma receptivity is important as it results in pollen recognition, adhesion and formation of pollen tube. The duration of receptivity may vary from few hours to few days. At receptivity, the stigma accumulates different biomolecules required for reproductive success. The purpose of present investigation is to identify the biomolecules and assess their critical role, in receptivity of stigma. Receptivity of *Helianthus annuus* L. (family Asteraceae), is evaluated by activity of enzymatic markers (through enzymatic method for histochemical localization), and the associated signaling molecules (localized by confocal microscopy). Esterases and Peroxidases act as the marker enzymes for receptivity in flowering plants. Interplay of reactive oxygen species (ROS), hydrogen peroxides and flavonoids facilitate stigma to override the stressful environmental conditions and also provide it resistance against pathogens. Present investigations, further reveal that the secondary metabolites present in stigma of sunflower act efficiently against the gram negative (*Escherichia coli*) and gram positive (*Staphylococcus* spp.) bacteria thereby highlighting stigma's ability to defend itself and inflorescence as a whole, from microbial infection during its development. The study, thus highlights the interplay of enzymes, reactive oxygen species and flavonoids in increasing cross-tolerance in


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Research Article
Hydrotrope assisted green synthesis of dicoumarols and *in silico* and *in vitro* antibacterial, antioxidant and xanthine oxidase inhibition studies
Abstract
Aqueous hydrotrope has been employed for the first time to synthesize heteroaryl dicoumarols by condensation of 4-hydroxycoumarin and different heterocyclic aldehydes. This method is highly efficient and green, and the same aqueous hydrotropic solution can be used up to five times without any considerable loss of yield in the product. The synthesized compounds showed good antibacterial potential against Gram-positive (*Staphylococcus aureus*/NTCC 0997 and *B. oceanisediminis*) and Gram-negative (*Escherichia coli*/D0157:H7 and *E. coli rosetta*) bacterial strains using the Resazurin microtiter plate visual method. The MIC value of 312 µg/ml for compounds **3b**, **3k** and **3l** for *S. aureus* while 39 µg/ml for compounds **3a**, **3b** and **3k** for *E. coli* and 625 µg/ml for **3a** and **3b** for *B. oceanisediminis* was observed. The compounds were screened via computational methods like molecular docking studies and molecular dynamic simulations with PDB id's 2W9S and 2EX6. Antioxidant activity was assessed
Related Research

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An understanding of coronavirus and exploring the molecular dynamics simulations to find promising candidates against the Mpro of nCoV to combat the COVID-19: A systematic review

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A B S T R A C T

The first infection case of new coronavirus was reported at the end of 2019 and after then, the cases are reported in all nations across the world in a very short period. Further, the regular news of mutations in the virus has made life restricted with appropriate behavior. To date, a new strain (Omicron and its new subvariant Omicron XE) has brought fear amongst us due to a higher trajectory of increase in the number of cases. The researchers thus started giving attention to this viral infection and discovering drug-like candidates to cure the infections. Finding a drug for any viral infection is not an easy task and takes plenty of time. Therefore, computational chemistry/bioinformatics is followed to get promising molecules against viral infection. Molecular dynamics (MD) simulations are being explored to get drug candidates in a short period. The molecules are screened via molecular docking, which provides preliminary information which can be further verified by molecular dynamics (MD) simulations. To understand the change in structure, MD simulations generated several trajectories such as root mean square deviation (RMSD), root mean square fluctuation (RMSF), hydrogen bonding, and radius of gyration for the main protease (Mpro) of the new coronavirus (nCoV) in the presence of small molecules. Additionally, change in free energy for the formation of complex of Mpro of nCoV with the small molecule can be determined by applying molecular mechanics with generalized born and surface area solvation (MM-GBSA). Thus, the promising molecules can be further explored for clinical trials to combat coronavirus disease-19 (COVID-19).

Contents

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UHPLC ANALYSIS OF POLYCYCLIC AROMATIC HYDROCARBONS (PAH) COMPOUNDS FROM THE SOIL BY QuEChERS AOAC METHOD FROM MANESAR INDUSTRIAL AREA, HARYANA, INDIA

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ABSTRACT

An Ultra-High-Performance Liquid Chromatography (UHPLC) method was developed and validated as per ICH guidelines for the analysis of 16 PAH compounds as per USEPA and various soil samples were analyzed in Manesar located 60 km away from Delhi, capital of India 28.3542° N, 76.9400° E in different seasons. The sampling was done in the industrial areas, agricultural fields, and residential plots all within 10 km radius of the industrial area. In the present study, the QuEChERS method was used for sample preparation, which has shown good recoveries around 80 to 120%. The extraction time was only 10 minutes, followed by the UHPLC technique of run time of just 16 minutes. Average PAH concentration in Manesar soil was found highest in the winter session of industrial areas. ∑16 PAH was 141 ppb in the industrial area in winter, 64 ppb in agricultural fields, and 54.7 ppb in residential plots. The lowest PAH levels were observed in the monsoon season. These values are very less if compared to Brazil, UK, Germany, and Korea.

Keywords: Soil, Manesar, PAH, QuEChERS, UHPLC

INTRODUCTION

Polycyclic Aromatic Hydrocarbons (PAH) are known carcinogenic and mutagenic compounds which are formed by burning organic matter with less oxygen presence and heavy vehicle emissions (**Sorensen, 1994**; **Nam *et al.*, 2003**). Such compounds need to be monitored and checked from time to time in industrial areas. Apart from mutagenicity, they are responsible for many other lungs and respiratory diseases (**Grimmer *et al.*, 1983**; **Yang *et al.*, 1991**; **Rost and Loibner, 2002**). In soil, these compounds are retained in humus and organic matter for a very long time as they are hydrophobic (**Krauss *et al.*, 2000**). Hence soil is the best place to trace out and check for PAH contamination (**Ockenden *et al.*, 2003**). Few studies have already been done in India, like in Delhi (**Kumar and Kapoor, 2004**), Mumbai (**Sahu *et al.*, 2001**), and Ahmedabad (**Ranyan and Shah, 1995**). PAHs are one of the most dangerous pollutants found in soil as per IARC. Higher ring PAHs are more carcinogenic (**Yang *et al.*, 1991**; **Massel and Oliveon, 2004**). The study of PAH becomes very essential in areas where the industries are very close to residential apartments and agricultural fields. Manesar located 60 km away from Delhi, the capital of India 28.3542° N, 76.9400° E is one of the fastest-growing industrial areas and townships. As per Human Rights Documentation Indian Social Institute, (India) Manesar has fertile lands which are used for farming. It's becoming more important to check the PAH levels in Manesar as it's a hub of farming lands, residential, industries, and all within 10 km area. The PAH-contaminated soil can be harmful to farming as PAH can percolate from soil to vegetables (**Wennrich *et al.*, 2002**). Many studies have shown that if vegetables are grown in PAH-contaminated soil, it may lead to the uptake of PAH in them (**Wennrich *et al.*, 2002**). High concentrations of PAH compounds were found in vegetables like a tomato at 0.2 µg/kg, spinach at 6.6µg/kg, and cabbage 20.4µg/kg (**M. Kluska, 2003**). So, the study of soil is very crucial to trace out PAH. Currently available and reported PAH analysis methods are long and time taking and use a classical sample preparation and analysis approach. Classical soxhlet extraction technique takes 8 to 12 hours of extraction of PAH from soil and uses a huge amount of extraction solvents which is then analyzed by HPLC technique whose run time was around 30 to 40 minutes for analysis of 16 PAH. This study has identified the use Quick, Easy, Cheap, Effective, Rugged, and Safe (QuEChERS) AOAC method which is very quick and rugged. QuEChERS (Quick, Easy, Cheap, Effective, Rugged, and Safe) is an acetonitrile-based extraction technique followed by dispersive solid-phase extraction (SPE) (**Anastassiades *et al.*, 2003**). Followed by this extraction technique a new UHPLC method was also developed and validated as per ICH guidelines which separate 16 PAHs in just 16 minutes.

MATERIALS AND METHODS

Regional site description

Manesar located 60 km away from Delhi, the capital of India 28.3542° N, 76.9400° E has become the hub of industrialization and real estate. The faster-growing industrialization needs the huge movement of heavy vehicles run on diesel. NH8 is the highway that connects Manesar to Gurugram and Delhi. Apart from the main highway NH8 various other roads pass through agricultural fields. One such road is Pataudi road which is the easiest and most popular road considered as an alternative to NH8. The frequency of heavy and small vehicles increased drastically throughout the last 5 years due to the sudden outburst of industrialization and real estate construction in Manesar. This road is surrounded by farmlands. PAH study is very essential to check the levels as heavy vehicle exhausts are a potential source of PAHs. Manesar itself has many factories which release smoke from chimneys. Chimneys are potential sources for PAH releases. During winter seasons, many organic materials are burnt like wood and coals as a source of fuel, which is again a potential source of PAH. Hence, PAH study has become essential in Manesar and surrounding areas. The climate of Manesar is dry and hot with a temperature range from 32°C to 48°C. In winter, the temperature ranges from 4°C to 30°C.

Sample collections

For sample collection, the entire Manesar area was categorized into three parts industrial area, an agricultural area, and a residential area. For analysis, 5 cm topsoil was taken through an auger and sieved through 20-mesh sieve, and stored in airtight plastic tubes in a refrigerator at 4°C. Total of 240 samples were collected, 80 samples from each location.

Extraction and analysis of PAH

QuEChERS AOAC technique was used for the extraction of PAH from the soil. In a 50 ml tube, 5gm soil samples were taken, followed by 5ml water and sonicated

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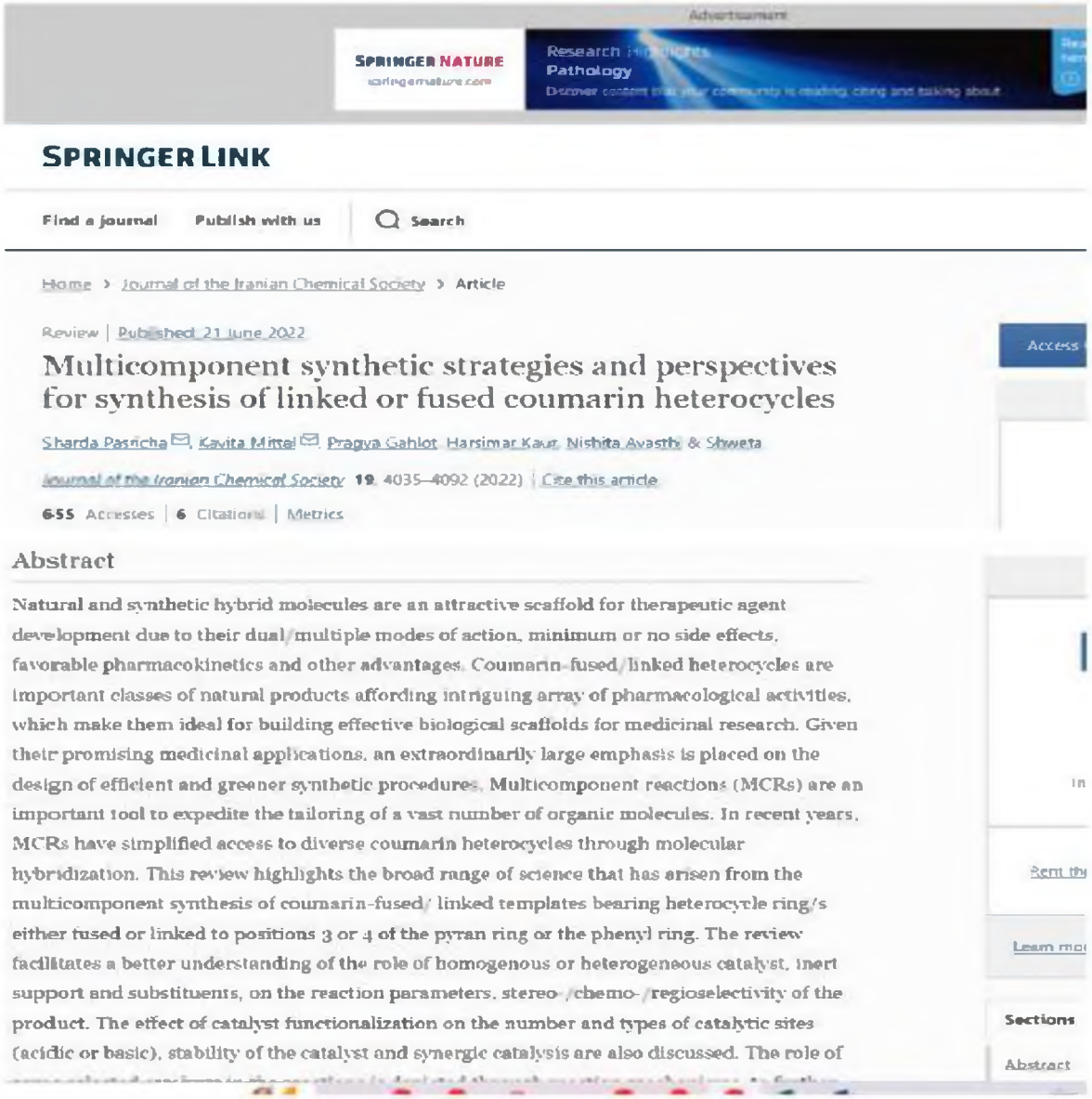
Multicomponent synthetic strategies and perspectives for synthesis of linked or fused coumarin heterocycles

Sharda Pasricha, Kavita Mittal, Pragya Gahlot, Harsimar Kaur, Nishita Avasthi & Shweta

Journal of the Iranian Chemical Society 19, 4035–4092 (2022) | Cite this article

Abstract

Natural and synthetic hybrid molecules are an attractive scaffold for therapeutic agent development due to their dual/multiple modes of action, minimum or no side effects, favorable pharmacokinetics and other advantages. Coumarin-fused/linked heterocycles are important classes of natural products affording intriguing array of pharmacological activities, which make them ideal for building effective biological scaffolds for medicinal research. Given their promising medicinal applications, an extraordinarily large emphasis is placed on the design of efficient and greener synthetic procedures. Multicomponent reactions (MCRs) are an important tool to expedite the tailoring of a vast number of organic molecules. In recent years, MCRs have simplified access to diverse coumarin heterocycles through molecular hybridization. This review highlights the broad range of science that has arisen from the multicomponent synthesis of coumarin-fused/linked templates bearing heterocycle ring/s either fused or linked to positions 3 or 4 of the pyran ring or the phenyl ring. The review facilitates a better understanding of the role of homogenous or heterogeneous catalyst, inert support and substituents, on the reaction parameters, stereo-/chemo-/regioselectivity of the product. The effect of catalyst functionalization on the number and types of catalytic sites (acidic or basic), stability of the catalyst and synergic catalysis are also discussed. The role of



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655 Accesses | 6 Citations | Metrics

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Sections

Abstract

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Research Article

Entropy for item inclination in sub-community based recommender system

Harita Ahuja[1], Sunita Narang[1], Sharanjit Kaur[1] and Rakhi Saxena[2*]
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Received: 09-April-2022; Revised: 22-August-2022; Accepted: 25-August-2022

Abstract

To overcome the new user cold-start problems in collaborative filtering, an innovative framework has been propsed that used entropy for item inclination in sub-community-based recommender system (EISR). It administered demographic filtering on user and item attributes for finding similar users and applied collaborative filtering on rating preferences. The proposed framework leveraged the advantages of traditional group aggregation strategies for delivering good quality recommendations using item preferences of the members of a refined group detected using two-tier approach. At Tier-I, user communities were detected using demographic attributes, which were decomposed into discernible sub-communities by exploiting the item preferences of users. A novel entropy-based hybrid group aggregation method called pragmatic propensity was used to combine the item preferences of members of these sub-communities. Also, experiments conducted using the MovieLens and Book-crossing datasets revealed the better quality of recommendations and the comparison with other algorithms confirmed the effectiveness of the proposed framework.

Keywords

Group recommender systems, Cold start problem, Community detection, Social network, Entropy, Item inclination, collaborative filtering, Demographic filtering, Group aggregation strategies.

1.Introduction

Machine learning (ML) entails self-learning via data usage and experience [1]. It requires no human intervention to uncover patterns in data [2]. Recent work in this area includes classification of liver tumours [3], extraction of clinical attributes from the breast cancer dataset [4]; prediction of student performance [5]; accurate recognition of complex physical human activity acquired using body-worn sensors [6]. Recommender system (RS) is also an exciting application of ML for suggesting relevant items to a user [7]. ML driven recommendation engines [8] have become ubiquitous in the last few decades. Intelligent web engines have crept in everywhere, recommending everything from movies, songs, food, social media posts to anything conceivable. Unconsciously, everybody is following these recommendations. The apparent reasons are convenience and satisfaction; else, dealing with a profusion of information on the web is quite cumbersome.

Famous online service providers like Facebook, Netflix, Spotify, Amazon, and LinkedIn use recommendation engines to boost sales and enhance customer satisfaction by utilising data filtering techniques of underlying RS [9].

RS uses traditional filtering techniques [10, 11] viz. collaborative filtering (CF), content-based filtering (CbF), demographic filtering (DF), and knowledge-based filtering (KF), along with hybrid filtering techniques that combine the benefits of former techniques [12]. Liao et al. have found that users trust systems that use CF for recommendation over those using CbF or DF and have given pointers for solving cold-start problems [13]. CF is the most sought-after technique that collects users' preferences and predicts their interests. However, unfortunately it suffers from cold-start problems (non-availability of preference information for the new user/item). Recent research points towards the inclusion of user demographic attributes (age, gender and location) to abate these problems [14]. Recently, González et al. have also utilized demographic information to evaluate the bias and unfairness of recommendations given to the minority groups [15].

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Group recommender systems, Cold start problem, Community detection, Social network, Entropy, Item inclination, collaborative filtering, Demographic filtering, Group aggregation strategies.

1.Introduction
Machine learning (ML) entails self-learning via data usage and experience [1]. It requires no human intervention to uncover patterns in data [2]. Recent work in this area includes classification of liver tumours [3], extraction of clinical attributes from the breast cancer dataset [4]; prediction of student performance [5]; accurate recognition of complex physical human activity acquired using body-worn sensors [6]. Recommender system (RS) is also an exciting application of ML for suggesting relevant items to a user [7]. ML driven recommendation engines [8] have become ubiquitous in the last few decades. Intelligent web engines have crept in everywhere, recommending everything from movies, songs, food, social media posts to anything conceivable. Unconsciously, everybody is following these recommendations. The apparent reasons are convenience and satisfaction; else, dealing with a profusion of information on the web is quite cumbersome.

Famous online service providers like Facebook, Netflix, Spotify, Amazon, and LinkedIn use recommendation engines to boost sales and enhance customer satisfaction by utilising data filtering techniques of underlying RS [9].

RS uses traditional filtering techniques [10, 11] viz. collaborative filtering (CF), content-based filtering (CbF), demographic filtering (DF), and knowledge-based filtering (KF), along with hybrid filtering techniques that combine the benefits of former techniques [12]. Liao et al. have found that users trust systems that use CF for recommendation over those using CbF or DF and have given pointers for solving cold-start problems [13]. CF is the most sought-after technique that collects users' preferences and predicts their interests. However, unfortunately it suffers from cold-start problems (non-availability of preference information for the new user/item). Recent research points towards the inclusion of user demographic attributes (age, gender and location) to abate these problems [14]. Recently, González et al. have also utilized demographic information to evaluate the bias and unfairness of recommendations given to the minority groups [15].

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Evaluation of Cost benefit Analysis using One-R Supervised Machine Learning Algorithm for Healthcare

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Research Article

Keywords: Classification, healthcare, Machine Learning, cost data analysis, decision making, predictions, Visualization

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Mildly reduced graphene oxide membranes for water purification applications

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Keywords: Mildly reduced graphene oxide, swelling, membrane, water purification

Abstract

Presently carbon allotropes namely graphene, graphene oxide (GO) and reduced graphene oxide (RGO) are being extensively utilized for water purification applications. The presence of myriad types of oxygen functional groups in the GO, however, makes this material very hydrophilic, allowing it to absorb water and to swell in moist or watery environments and to significantly damage its intended performance. In contrast, fully reduced graphene oxide membranes are not stable due to fewer oxide groups which are mainly responsible for GO flakes stacking. In the present work, the aforementioned problems are overcome by optimizing the oxygenated functional groups to develop mildly reduced graphene oxide (MRGO) membrane over PVDF (polyvinylidene fluoride) support. GO is reduced by L-Ascorbic Acid (LAA) with different amounts of wt.% and an optimized MRGO membrane is achieved at 10 wt.% of LAA, which is stable and showing comparatively lower swelling than GO membrane. All related structural and optical characterizations like XRD, SEM, EDAX, Raman, FTIR, and Contact angle have been done to evaluate the effect of mild reduction of GO. The studies are indicative of their potential application in water purification.

1. Introduction

Water purification is a method that eliminates harmful chemical compounds [1], organic/inorganic substances [2] including pharmaceutical wastes [3], cations [4] and biological pollutants [5] from water. It also involves distilling (turning a liquid in vapor and further condensing it in liquid form) and deionizing (ion removing by extracting dissolved salts) [6]. The purification of water is mainly aimed at providing clean water. Water purification also meets the needs of safe and drinking water applications in medical, pharmacological, chemical and industrial applications. The purification process reduces contaminant concentrations such as suspended particles, parasites, bacteria, algae, viruses, and fungi [7]. Many technologies are being used for water purification in which membrane-based separation is at high demand because it operates without heating and thus utilizes less electric energy than standard processes of heat separation like distillation, sublimation or crystallization [8]. Since the practical discovery of the first 2D material called graphene, much focus is paid to two dimensional structures in condensed matter physics, material science and chemistry [9, 10]. Due to its unique atomic thickness and micrometer lateral dimensions, 2D materials have increasingly been explored as a fundamental medium to establish separation technologies [11–14]. Graphene oxide (GO), the oxidative form of graphene, is rated at a high level due to its unique permeation path, large surface area, outstanding anti-fouling properties, high chemical tolerance, high hydrophobicity [15, 16]. It is a single layer of carbon monoatomic on the basal planes and sides, formed in a honeycomb with oxide groups (epoxide, carboxyl, and hydroxyl) [17, 18]. Water permeance and dye rejection depend on various parameters. In a recent review article by Moghadam *et al* [19], membranes in form of atomically thin nanosheets or assembled laminated sheets using 2D materials like graphene, the filtration mechanism of gas and liquid species depend on size and density of pores, defects in the

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An Inclusive Science Laboratory for Visually Impaired Students

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Abstract : Education is a powerful tool that has the potential to improve the social and economic condition of a person in a developing country like India. The greatest challenge for the Government is the accomplishment of quality education in inclusive and accessible arrangements for persons with disabilities. The teaching techniques adopted in traditional classrooms aren't usually designed to cater to the need of visually impaired students. Visually impaired students are usually held back from pursuing STEM (Science Technology Engineering and Maths) education and are encouraged to take up humanities and commerce. The lack of resources is mostly responsible for holding back visually impaired students from pursuing Science along with other factors such as the incompetence and attitude of the facilitators. In this work, an inclusive science laboratory for visually impaired students is envisaged using assistive technology that can facilitate them in performing lab experiments. Assistive technology plays a crucial role in the shift of the education system for visually impaired students to an inclusive model. Low cost, easy to use and store, hardware modules with talkable features has been designed to measure temperature, time, to detect contrast and color using Arduino UNO. With the help of these modules, a visually impaired student can be assisted to perform laboratory experiments effortlessly, which otherwise is not made accessible to them.

Keywords: Arduino, assistive technology, Inclusive science laboratory, visually impaired.

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1. Introduction

The economic status of a citizen has its dependence on access to education. Educated youth is incredibly skilled to mold and reinforce growth prospects. Education can enable a person to make an informed decision and further can result in participative citizenship in a democratic environment. The Constitution of India guarantees equality of all its citizens in every respect and this is pertinent to education as well. The right to Education Act was passed by the parliament of India in 2009. It made education, a fundamental right of all children of the age group 6-14 years irrespective of their caste, creed, social status, and even physical disability. To date significant steps have been taken by the Indian Government, both at the central level and at the state level, to promote education amongst children. The Central Government has supported many schemes like District Primary Education Programme (DPEP), Sarva Shiksha Abhiyan (SSA), Rashtriya Madhyamik Shiksha Abhiyan (RMSA), Samagra Shiksha to

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FLEXIBLE INVENTORY SYSTEM OF IMPERFECT PRODUCTION UNDER DETERIORATION AND INFLATION

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Abstract: This study emphasizes the development of a flexible inventory system considering rework requirements on imperfect and defective items. This work has considered defective items could be sold at a lower price in the market as compared to the perfect items. The developed model has considered Weibull deterioration and inflation to balance the same amount in the future due to its potential earning capacity. And demand's function depends on price as well as inventory level because a large pile of goods and their price strategy attracts more customers to generate higher demand. The work also supports managerial decision-making by focusing on the volume flexibility system for smooth production runs. The mathematical formulation of the developed inventory system tries to optimize the inventory cost function under a realistic scenario. A solution procedure has been illustrated and assisted with a numerical example. Later, a validation test is also performed to check the robustness of the proposed mathematical model. The findings of the study will support policymakers, strategists, and firms to implement

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International Journal of Analysis and Applications

Effects of Mass Variation in the Collinear Perturbed Moulton-Copenhagen Configuration

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Abstract. The main idea of this paper is to investigate the motion properties of the smallest body under the gravitational forces of the three collinear spherical primaries. Here we place the three primaries on the same line where the masses of two primary bodies are taken equal and third primary body is having the solar radiation effect. The effects of Coriolis and centrifugal forces on the system is considered. Therefore this system is recognized as collinear perturbed Moulton-Copenhagen configuration. After determining the equations of motion and quasi-Jacobi integral, we numerically illustrate the locations of equilibrium points (in-plane and out-of-plane), regions of motion, Poincare surfaces of section, basins of attraction and periodic orbits. And then the examination of stability for the equilibrium points lie either in-plane or out-of-plane are examined.

1. Introduction

One of the extensions of the restricted three-body problem is the restricted four-body problem in the fields of Mathematics and theoretical Physics. Where two types of configurations are found in the literature. First when the three-primaries are placed at the vertices of a triangle and the second when the three-primaries are placed at the same horizontal line. Till now many researchers have studied about the first type of configuration with various types of perturbations while the second type of configuration is studied by very few researchers. But it is also an interesting configuration for study.

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Key words and phrases. perturbed Moulton-Copenhagen configuration; variable mass; Jeans law; out-of-plane equilibrium points.

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The Implementation of the Pentagonal Fuzzy Number toward the Solution of the Fuzzy Inventory Model with Ramp Demand Function and Three Parameters Weibull Deterioration

Deo Datta Aarya[1], Shashi Prakash[2], Rahul Boadh[3], Anand Chauhan[4], Yogendra Kumar Rajoria[5]*

Abstract

The purpose of this study is to provide an ordering strategy for commodities that deteriorate over time using ramp-type demand rates, shortfalls, and deterioration rates. The ramp-type demand function moves up and down through duration up to a particular point before becoming constant. It is predictable. The three-parameter Weibull deterioration rate, which considers both things that have recently deteriorated while being received into an inventory system and items that may deteriorate in the future, shows the changes in deterioration rate over time. Owing to the inclusion of uncertainty, model factors such as deterioration, ordering, carrying, and shortage costs are examined by a fuzzy approach and defuzzy by the GMI method, which optimises the entire average cost for the model. This seems to be applicable for seasonal items as well as newly introduced high-tech items like computers, tablets, and smart phones.

Keywords: Weibull deterioration, Graded mean integration (GMI), Fuzzification
DOI Number: 10.14704/Nq.2022.20.17.Nq88017 Neuroquantology 2022; 20(17):115-124

1. Introduction

Nowadays, numerous organizations allow their businesses to flourish by effectively managing their inventory. As a result, maintaining and controlling stocks is a huge burden for businesses. "Inventory refers to any economically valuable resources that are being prepared for sale at various phases. Inventory management is crucial to the efficient and effective operation of an organization. On the one hand, having too much inventory might add a significant expense to the firm. Holding relatively few stocks, on the other hand, may result in stock-outs and the loss of future clients. The inventory hypothesis provides a solution to these kinds of difficulties by addressing the fundamental considerations of when and how much more to order. One of the fundamental models of inventory theory is the economic order quantity (EOQ) model developed [1]. Nowadays, it is difficult for retailers and distributers to accurately assess demand. Furthermore, most of the time, the inventory decision-maker does not have access to appropriate historical data or statistical assumptions are ridiculous. Using classic inventory models in real life is difficult in each circumstance. To deal with unreliable data in decision-making, it is preferable to use a fuzzy number to define inventory parameters. In developing an inventory model, the impact of deterioration must be considered as a

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Space Dependent Study of Fast Neutron Spectra and Tritium Produ... Rate in a Fusion Reactor Blanket of Li_2O

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Study of spatial spectra and tritium breeding ratio (TBR) in a lithium blanket play a crucial role for the ... operation of a Fusion reactor. In the paper, we have reported the results for the space dependent fast neutron ... tritium production rate (TPR) in cylindrical assemblies of Li_2O. The transport equation has been ... Gaussian quadrature method. The obtained results for scalar spectra, total flux and TPR in Li_2O are ... corresponding values for natural Li. The same parameters under consideration in Li_2O has been compared for ... configurations (slab, sphere and cylinder(s). We find that the shapes of the curves are almost similar, ... flux is found to be highest in the case of cylindrical assembly. This suggests a larger value of total TBR for ... geometry. Further, the study of space variation of total flux for Li_2O and natural Li, shows that flux is not ... the shapes and numerical values, however, is quite similar near the boundary and surface of the assembly. ... considered medium Li. Similarly, the fall in the TPR curves becomes more rapid for the case of Li_2O as compared ... to near the boundary ends. The estimated results of spatial distributions of TPR for ^6Li (n,α) and ^7Li (n,nα) ... compared ... obtained results for cylindrical case documents and it is found very appreciable ... both in the case of ^6Li and ^7Li.

Keywords: Lithium oxide blanket, Tritium Production Rate, Tritium breeding ratio

I Introduction

Lithium bearing blankets in a futuristic Fusion reactor have been a subject of interest for the past several decades, and continuing efforts are being made to study the neutron energy spectra and achieve a suitable value of Tritium Breeding Ratio (TBR) in ... assemblies of Li compounds.

For a steadfast, safe and self sufficient operation of a DEMO (DEMOnstration) power plant as a futuristic Fusion Reactor, the crucial parameter is Tritium Breeding Ratio and equally important is the study of neutronic spectra toward reshaping and safety analysis of the reactor. Tritium is not available in abundance as a natural resource that may be used as fuel in a fusion reactor, however, it can be created in the blanket enclosing the fusion chamber by a reaction between neutrons and lithium. This makes it important to

Variety of factors influence the value ... choice of breeding material, geometrical ... layout and neutronic calculations', ... suggested evaluation method for TBR ... Transport equation. Studies of Tritium ... with He cooled Lithium Lead Fusion ... also been reported by Indik Rosaiah ... calculations (based on MCNP program ... neutron flux produced by ... blanket of Pb-Li does not leak and the ... tritium would be optimal. Sahlberg et al ... an appropriate neutral for an advanced ... of future TOKAMAK fusion reactor ... (Li_4SiO_4) material in the form of pebbl... used as structural material, and Beryll... multiplier. They studied TBR, and con... should be enriched to 40% for the ...

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RESEARCH ARTICLE | OCTOBER 07 2022

Effect of variation in glancing angle deposition on resistive switching property of WO_3 thin films for RRAM devices

Shiva Lamichhane, Savita Sharma, Monika Tomar, Arijit Chowdhuri

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In this paper, nanostructured tungsten oxide (WO_3) thin films are deposited using the RF-magnetron sputtering technique in Glancing Angle (GLAD) arrangement. Variation in the structural, morphological, optical, and resistive switching (RS) characteristics of nanostructured WO_3 film is investigated as a function of GLAD angle (60°–80°). Electrical studies on nanostructured WO_3 films deposited at room temperature are found to exhibit enhanced bipolar resistive-switching properties in metal–insulator–metal pattern [Au/WO_3/ITO]. The R_{off}:R_{on} ratio between high and low resistance states was noted to be about 190 besides a minimum set voltage of ~2.22 V in the case of the WO_3

metal–insulator–metal pattern [Au/WO_3/ITO]. The R_{off}:R_{on} ratio between high and low resistance states was noted to be about 190 besides a minimum set voltage of ~2.22 V in the case of the WO_3 thin film deposited at the 70° glancing angle. A detailed current transport mechanism analysis indicates the existence of ohmic behavior and trap assisted space charge limited conduction as the governing mechanisms at the state of low and high applied bias, respectively. Good data retention characteristics coupled with reproducible and fast RS capabilities obtained with Au/WO_3/ITO device structure promise scope of rapid development in future RS-based novel memory device applications.

Topics

Electrical properties and parameters, Nonvolatile memory, Flash memory, Atomic force microscopy, Magnetron sputtering, Resistive switching, Thin film deposition

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ABSTRACT
We present an improved method for the determination of membership of an open cluster using ensemble-based unsupervised machine learning techniques. The working principle of this method relies on two stages: (i) choosing a suitable range of three astrometric parameters (ϖ, $\mu_\alpha \cos\delta$, μ_δ) using k-nearest neighbour (kNN) algorithm on the data downloaded for the cluster within a smaller search radius. (ii) application of two component Gaussian mixture modelling (GMM) on the resulting one dimensional Gaussian distribution of Mahalanobis distance (MD) of stars using the range of parameters obtained from the earlier step, but with the data downloaded within a bigger search radius. MD is calculated from the mean of each of the parameters in three dimensions. Thus the use of MD reduces the input of the GMM from the 3D parameter space into a 1D parameter space for the cluster membership determination. The method has been tested on a few clusters including those which have overlaps in some/all the parameters using the data obtained from the Gaia DR3 data base. It is found that the approach can easily separate the cluster members from the field stars. The clean colour-magnitude diagrams and similar direction of proper motions of the member stars obtained for the clusters shows that this method is very efficient and robust in
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Regular Article | Published: 02 September 2022

Two-photon bound-to-bound transitions under strong screening potential

Bachna Joshi

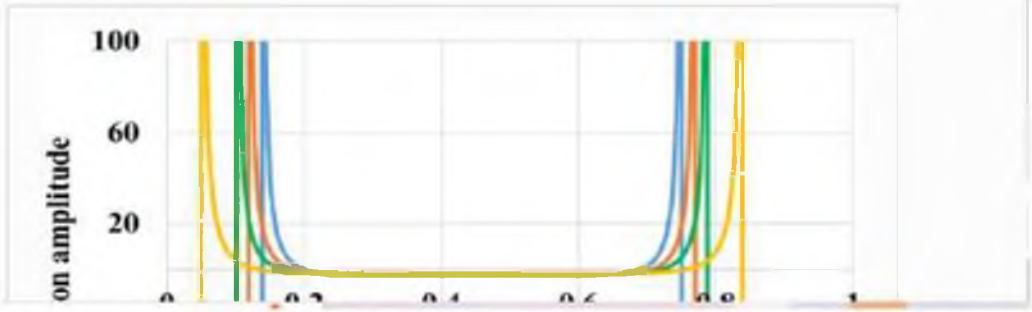
The European Physical Journal Plus 137, Article number: 996 (2022) | Cite this article

89 Accesses | Metrics

Abstract

Two-photon transition amplitudes for bound-to-bound transitions in hydrogen are calculated for the most general exponential cosine screened Coulomb (MGECSC) potential which is of relevance in many branches of physics. The variation in transition amplitude with different potential parameters is investigated. Enhancement in the transition amplitudes is observed when, on absorption of a single photon, the system is in resonance with an intermediate level. To the best of the knowledge of the author, the MGECSC potential has not been applied previously to the problem of two-photon excitation.

Graphical abstract



Regular Article – Atomic Physics | Published: 26 August 2022

Theoretical analysis of relativistic energy corrections, partition function and thermodynamic properties of spherically confined hydrogen atom

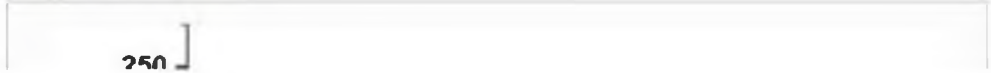
Rachna Joshi, Arun Goyal, Pranav Kumar & Man Mohan

The European Physical Journal D 76, Article number: 149 (2022) | Cite this article

Abstract

The relativistic energy corrections for the spherically confined hydrogen with penetrable wall are calculated for various orbitals as a function of pressure and confinement radius. The relativistic corrections at high pressures of the order of 10^8–10^9 atm are found to be more than thousand times higher than the corresponding values for the free atom. For calculating the energy eigenvalues, the efficient Numerov method is adopted. The partition function and other thermodynamic properties are also calculated for temperature range 10^4 K to 10^{10} K at low (0–10 atm) and high pressures (10^4–10^8 atm). We investigate the behaviour of partition function and thermodynamic parameters graphically with pressure and temperature. We discuss the effect of high temperature and reduction of confinement radius on these parameters. The present study will be useful in Industrial applications like development of hydrogen fuel and in various physics branches such as in fusion and astrophysical plasma, condensed matter, statistical mechanics and also in other research areas where we encounter atoms which are subjected to high pressures.

Graphical abstract



RESEARCH ARTICLE

A novel RP-HPLC method for quantification of cholinesterase activity in human blood: An application for assessing organophosphate and carbamate insecticide exposure

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Data Availability Statement: All relevant data are within the paper.

Abstract

Several methods have been reported to estimate Acetylcholinesterase (AChE) enzyme activity in blood samples. The Ellman assay is the most important among all but with several shortcomings, and there is a need to develop a method which is accurate, sensitive and quick for analyzing AChE. Therefore, we have developed an assay utilizing RP-HPLC with UV detection for the determination of AChE activity. This method measured the conversion of 1-naphthol acetate to 1-naphthol to estimate AChE activity in blood samples. Performance was judged on the basis of reproducibility, sensitivity, accuracy, and the ability to screen enzyme activity within 20minutes. A series of experiments were performed, varying the concentration of blood and substrate, with optimal sensitivity using 50 μM substrate and 10μL blood. The validation parameters such as linearity (R^2 of ≥ 0.9842 for 1-naphthol and ≥ 0.9897 for 1-naphthol acetate), precision (94.21–96.41%), accuracy (85.2%–99.6% and 82.6%–99.3% for 1-naphthol and 1-naphthol acetate respectively), and robustness were validated according to International Conference on Harmonization (ICH) guidelines. Blood samples were collected from healthy people, farmers exposed to spraying of pesticides, and suicidal patients who ingested pesticides and were hospitalized and were analyzed by the developed method. The AChE level was approximately 21 units/mL compared to 24units/mL in controls, whereas suicidal patients showed the least AChE levels of 1 unit/mL. The employment of this method is recommended for estimating AChE level on various matrices.

Introduction

Pesticides are routinely used in agriculture, especially organophosphorus (OP) and carbamate pesticides. Pesticide residues in drinking water and food have sparked health concerns. There

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Morphological and physiological changes induced by *Achyranthes aspera*-mediated silver nanocomposites in *Aedes aegypti* larvae

Aarti Sharma†, Monika Mishra, Vinay Singh Dagar and Sarita Kumar*†

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Aedes aegypti is responsible for the global spread of several ailments such as chikungunya, dengue, yellow fever, and Zika. The use of synthetic chemicals is the primary intervention in mosquito management. However, their excessive utilization resulting in the spread of toxic ingredients in the environment and posing threats to beneficial organisms has prompted the recommendation for the use of biologically synthesized nanocomposites as a promising approach for vector control. Silver nanocomposites were synthesized using leaf (AL-AgNCs) and stem (AS-AgNCs) extracts of *Achyranthes aspera*. The early fourth instars of *A. aegypti* were exposed to lethal doses of these nanocomposites to evaluate their effects on larval development, behavior, morphology, and mid-gut histoarchitecture. The cellular damage and deposition of nanocomposite residues in the mid-gut were studied using light and transmission electron microscopy. The *A. aspera* silver nanocomposite (AA-AgNC)-exposed larvae exhibited dose-dependent extended duration of development and diminished adult emergence, but did not exhibit modified behavior. Intense damage to the cuticle membrane and slight contraction in the internal membrane of anal papillae were noticed. Morphologically, the mid-gut appeared disorganized, darkly pigmented, and shrunk. Histological investigations of the mid-gut revealed significantly disordered internal architecture with lysed cells, damaged peritrophic membrane and microvilli, disintegrated epithelial layer, and a ruptured and displaced basement membrane. Visualization of the larval mid-gut through TEM showed severe cellular damage and aggregation of black spots, indicating the deposition of silver particles released by AA-AgNCs. The investigations revealed the bio-efficacy of *A. aspera*-mediated AgNCs against *A. aegypti* inducing stomach and contact toxicity in the larvae. The utilization of AA-AgNCs is recommended for *A. aegypti* management as a safe and effective intervention.

KEYWORDS
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Research Article
Online ISSN:2651-3579

Docking-Based Virtual Screening Ascertaining β-Sitosterol-Induced Alterations in the *Helicoverpa armigera* Hübner Gut Enzymes

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ABSTRACT

Present investigation attempts to study binding of β-sitosterol with *Helicoverpa armigera* midgut enzymes; alanine aminotransaminase (ALT), aspartate aminotransaminase (AST) and alkaline phosphatase (ALP); through docking-based virtual screening. Extraction of the protein sequence of the enzymes revealed a respective linear chain of 535, 522 and 430 amino acids for ALP, ALT and AST. The binding energy for ALT-ligand complex was lowest as compared to the AST and ALP-docked complexes. The ALT-docked complex had ligand efficiency of (-) 0.32 with an inhibition constant of 104.01, more hydrogen bonds and hydrophobic interactions leading to a more stable complex. However, unfavored bumps in AST and ALP complexes may have led to comparatively unstable complexes. The dietary β-sitosterol exhibits differential binding with midgut enzymes of *H. armigera* larvae. The strong binding of β-sitosterol with ALT indicates the highest inhibition of ALT activity due to the activity-stability trade-off. The enzymes, AST and ALP exhibited relatively higher activity as a resultant of lesser stabilization of the β-sitosterol-enzyme complex. *In silico* studies have indicated that β-sitosterol can be used an effective control agent against *H. armigera*.

Keywords: *Helicoverpa armigera*, β-sitosterol, alanine aminotransaminase (ALT), aspartate aminotransaminase (AST), alkaline phosphatase (ALP), docking-based virtual screening.

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ABSTRACT

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Keywords: *Helicoverpa armigera*, β-sitosterol, alanine aminotransaminase (ALT), aspartate aminotransaminase (AST), alkaline phosphatase (ALP), docking-based virtual screening.

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An overview on non-*Apis* bees *vis-ă-vis* the exploration of integrated taxonomic approach (Hymenoptera: Apoidea)

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Abstract
Easy and proficient identification of species or organisms is important for various users, such as conservationists, physiologists and ecologists, etc. Taxonomy is a significant branch of biological sciences to classify the different species and understand their relationships. Currently, taxonomy's existence is under crisis and its future protection is required in coming times. Majority of taxonomists are using phylogenetic approach for classifying different species. However, scientists believe that taxonomy should be integrative based on a comprehensive framework for delimiting and describing taxa through integrated information using various data and methodologies. This novel approach does not aim to replace the traditional taxonomy but stresses upon the delineation of species over naming new species. Integrative taxonomy defines the units of species diversity employing multiple approaches; like population genetics, phylogeography, ecology, comparative morphology, development and behaviour, etc. Disagreements among disciplines over the number and demarcation of species can be resolved by using molecular data explaining the evolutionary relationships among species. We present a comprehensive review to explore and identify various non-*Apis* bees and their relationships using integrated taxonomical approaches. We believe that the phylogenies and supportive data can collectively provide a comparative framework for understanding the evolutionary relationships among bee families.

Key words: Integrative taxonomy, non-*Apis* bees, phylogenetic relationships, review, species delineation.

Introduction

Taxonomy is a highly significant branch of biological sciences which mainly aims to classify the different species and understand their relationships between them. Currently, scientists believe that taxonomy' existence is under crisis and its future protection is required in coming times (Wheeler et al. 2004). It is estimated that around 10 million more species exist in nature which still remain to be discovered and in order to do this, we must clarify the nature of primarily two taxonomic tasks, namely delineating and classifying species (Wheeler et al. 2004). These two scientific tasks are currently performed by taxonomists in different ways.

Earlier species diversity and identification studies completely relied on the traditional taxonomy based on morphological characters. Currently, phylogenetic study is a major approach of taxonomists for classification of different species an to reconstruct innate relationships among living organisms; though, in early 1970s, phylogenetic method was a challenge to the taxonomists (Felsenstein 1979). Traditional taxonomists, however were not only in consonant with population biologists and phylogeographers but they also disagreed methodology developed by them for delimiting species (Sites & Marshall 2003). The communication gap between different disciplines involved in delimiting species resulted in 'taxonomy crises'. In order to solve this, scientists believed on integrative taxonomy proposing that this amalgamation will decide the future of taxonomy in coming times.

The term 'Integrative taxonomy' came into existence in 2005 implying a comprehensive framework for delimiting and describing taxa through integrated information using various data and methodologies (Will et al. 2005). The diversity and phylogenetic relationships studies on the families of various major insect groups, such as Coleoptera (Bhardwaj & Jyoti 2018), Hymenoptera (Sharkey et al. 2011), Diptera (Cameron et al. 2007) and Hemiptera (Medeiros et al. 2013) have been carried out by many researchers worldwide. However, the suspect of many systematists that majority of species would remain undescribed using

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Metabolic detoxification and *ace-1* target site mutations associated with acetamiprid resistance in *Aedes aegypti* L

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Despite the continuous use of chemical interventions, *Aedes*-borne diseases remain on the rise. Neonicotinoids are new, safer, and relatively effective pharmacological interventions against mosquitoes. Neonicotinoids interact with the postsynaptic nicotinic acetylcholine receptors (nAChRs) of the insect central nervous system, but the absence of nAChR polymorphism in resistant phenotypes makes their involvement in neonicotinoid resistance uncertain. Thus, an investigation was carried out to understand the role of metabolic detoxification and target site insensitivity in imparting acetamiprid resistance in *Aedes aegypti* larvae. Studies were conducted on the parent susceptible strain (PS), acetamiprid-larval selected strain for five generations (ACSF-5; 8.83-fold resistance) and 10 generations (ACSF-10; 19.74-fold resistance) of *Ae. aegypti*. The larval selection raised α-esterase and β-esterase activities by 1.32-fold and 1.34-fold, respectively, in ACSF-10 as compared to PS, while the corresponding glutathione-S-transferase and acetylcholinesterase activity increased by 2.2.5 and 2%. The *ace-1* gene in PS and ACSF-10 showed four mismatches in the 1312–1511 bp region due to mutations in the Y455C codon (tyrosine to cysteine) at the 1367th position (TAC→TGC); I457V codon (isoleucine to valine) at 1372 bp and 1374 bp (ATA→GTG); and R494M codon (arginine to methionine) at 1484 bp (AGG→ATG). The R494M mutation was the novel and dominant type, observed in 70% ACSF-10 population, and has not been reported so far. The studies evidenced the combination of metabolic detoxification and target site mutation in imparting acetamiprid resistance in *Ae. aegypti*.

KEYWORDS
Aedes aegypti, acetamiprid, resistance, metabolic detoxification, mutation, target site

Introduction

Aedes aegypti L. is a widespread disease vector posing a wide range of health risks, particularly in tropical and subtropical areas owing to favorable climatic conditions. Ever since the emergence of various *Aedes*-borne diseases, dengue has become a major public health concern, with reports of 390 million annual dengue infections and 96 million

EVIDENCE OF BREEDING OF *JAMIDES BOCHUS* (STOLL, [1782]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) IN NEW DELHI, INDIA

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Reviewer: Peter Smetacek

The butterfly Dark Cerulean (*Jamides bochus*) was first recorded in Delhi by Larsen in 1985, who considered it a case of migration (Larsen, 2002). It was also reported from Delhi in the late 1990s (Chaudhary *et al*., 2019, Dr. Surya Prakash, *pers. comm.*). The sighting of Dark Cerulean however has become quite frequent in Delhi during the last five years, with several sightings between July to March every year (Chaudhary *et al*., 2020, Rajesh Chaudhary unpublished records). It was also found laying eggs on its host plant *Millettia pinnata* (L.) Panigrahi (Fabaceae) in Delhi on one occasion in the year 2020, indicating that it might have extended its breeding range towards drier parts of North-west India (Chaudhary *et al*., 2020).

In the present communication, we report additional supporting evidence which strengthens our assertion that the recent sighting records of Dark Cerulean in Delhi are members of a breeding population rather than of migrants.

An individual of Dark Cerulean butterfly was spotted hopping on the ground in a residential area of South Delhi (28° 32 '22" N, 77° 15' 46" E) on 31.viii.2022, close to its host plant *Millettia pinnata* (Figure 1). On close examination, it was found that both the wings on one side of the butterfly were malformed (Figure 1). The butterfly was also found to be freshly eclosed. It could barely fly 1-2 meters at a time.

The above observations indicate that this individual of Dark Cerulean eclosed with malformed wings in the area where it was spotted. Therefore, it is additional evidence which affirms the breeding status of Dark Cerulean in Delhi.

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SIGHTING OF RUDDY MEADOW SKIMMER *NEUROTHEMIS INTERMEDIA* (RAMBUR, 1842) (INSECTA: ODONATA: LIBELLULIDAE) IN DELHI, INDIA

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The dragonfly, Ruddy Meadow Skimmer (Paddyfield Parasol) *Neurothemis intermedia* (Rambur, 1842) is widely distributed in India, Sri Lanka and many South-East Asian countries (Fraser, 1936; Subramanian, 2009; Singh, 2022). In India, it is found throughout peninsular India, Bengal, Assam, and Sikkim (Fraser, 1936; Subramanian, 2009). In northwest India, it has been reported from the states of Uttarakhand, Uttar Pradesh, Punjab, Himachal Pradesh, Haryana and Rajasthan (Singh, 2022). Despite its widespread occurrence in northwest India, it has not been reported from Delhi (Kumar, 1997; Singh, 2022). This dragonfly is usually found in grasslands, marshy vegetations near ponds and lakes, and paddy fields (Suri Babu, 2000; Subramanian, 2009; Singh, 2022). It is seen on the throughout the year except during winter months as long spells of cold temperature slow down the development of larval stage (Suri Babu, 2000).

Males of the Ruddy Meadow Skimmer have a bright red abdomen with brownish ventro-lateral stripes; rusty-brown thorax; transparent wings with an amber-yellow patch at the base of both the pairs of wings. Females are similar to males, but have more defined ventro-lateral abdominal markings; pale-yellow wings, and lack the amber-yellow patch at the base (Fraser, 1936; Subramanian, 2009; Singh, 2022). An andromorphic form of female Ruddy Meadow Skimmer has been reported in one instance from central India (Prasad, 2000; Joshi *et al.*, 2020).

An individual of *Neurothemis intermedia* was observed in the residential area in northwest Delhi (28° 42' 30" N, 77° 07' 49" E) on 2nd August 2020, at 10:30 am. The dragonfly was roosting on a cable wire, and was photographed using digital SLR camera (Figure 1). The features of dragonfly notable from the photographs include-pale labrum, clypeus and frons; eyes - reddish-brown above and pale-grey below; thorax, rusty-brown and bright red abdomen with ventro-lateral blackish-brown stripes interrupted at apical end of the segments; both pairs of wings with amber-yellow base and dark reddish-brown pterostigma. These features are indicative of the individual being a male. However, it possessed female-like anal appendages (Figure 1C). Thus, the observed individual of Ruddy Meadow Skimmer was an andromorphic form of female.

The observed Ruddy Meadow Skimmer could be a vagrant to Delhi. It is also possible that the species is a resident of Delhi, and the observed individual has migrated into the residential area from its

OVIPOSITING RECORD OF TAILLESS LINEBLUE *PROSOTAS DUBIOSA* (SEMPER, [1879]) (INSECTA: LEPIDOPTERA: LYCAENIDAE) FROM THE VICINITY OF DELHI

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The butterfly, Tailless Lineblue is widely distributed in India (Varshney & Smetacek, 2015; Kehimkar 2016). It was, however, recorded only recently from Delhi and its immediate vicinity (Chaudhary *et al.*, 2021). Since then, it has been reported on several occasions from the aforementioned area during monsoon and post-monsoon months i.e. August to December (Rajesh Chaudhary, *personal observations*). It is not apparent if the recent sightings of Tailless Lineblue in the area are a case of chance migration or if the observed individuals belong to a breeding population (Chaudhary *et al.*, 2021). In the present communication, the ovipositing of Tailless Lineblue at the Aravalli Biodiversity Park, Gurugram is reported. The Park touches the southwestern boundary of Delhi and is an ecological restoration site planted with flora native to the Aravalli hills.

Two individuals of Tailless Lineblue were seen laying eggs on nascent flower buds of the tree *Acacia leucophloea* (Roxb.) Willd. in Aravalli Biodiversity Park, Gurugram (28°29'02"N, 77°06'50"E) on 15.x.2022 (Figure 1). These individuals were observed for about 20 min, and photographed using a digital SLR camera fitted with a telephoto zoom lens. Throughout the duration of observation, both individuals laid eggs several times on the *Acacia leucophloea* tree.

The above observations indicate that individuals of Tailless Lineblues which are being sighted so often in Delhi and its vicinity in recent times belong to a population breeding in this area. The present observation adds Tailless Lineblue to the list of butterfly species that are known to breed in Delhi and its immediate vicinity.

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Arbuscular mycorrhizal fungi and host-plant relationship with respect to heavy metal remediation of soil

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ABSTRACT

A multitude of contaminants have entered the environment and are harmful to living beings. Agricultural plantations growing in unfavourable environments undergo various abiotic stresses due to heavy metals. These factors reduce plant growth and pose a threat to the plant population. Various traditional techniques are used to remove contaminants from the contaminated soil, like incineration, soil washing, chemical precipitation, soil excavation, detonation, and many more. Recently, phytoremediation is proving to be very effective as a green method of soil remediation and involves using plants to extract, sequester and detoxify pollutants. Many recent studies have shown that using hyperaccumulators associated with efficient endophytic or rhizosphere microbial communities is efficient in enhancing phytoremediation. In this context, arbuscular mycorrhizal (AM) fungi may be a highly suitable contender because they are an indispensable member of rhizosphere microflora. Their application to hyper-accumulators is important. The combined effect of both can improve the efficiency of the remediation process by shortening the multiplication cycle and can help maintain the stability and persistence of remediation. This review will explain two main aspects of AM fungal–Plant relationship with respect to HM remediation of soil.

Key words: Heavy metals, Soil remediation, Phytoextraction, Phytostabilization

INTRODUCTION

In the environment, many contaminants pose a threat to living organisms. Among these heavy metals, pesticides, radionuclides, and persistent organic pollutants (POPs) are key contaminants of concern. Pesticides, notably chlorinated organic chemicals (aldrin, DDT, dieldrin, lindane, endosulfan, and others), were used extensively in farming techniques, resulting in their persistence in air, water, and soil, as well as biomagnification or bioaccumulation in living systems/cells. This is owing to their hydrophobicity, nonpolarity, lipid solubility, and volatility (Hagen and Walls, 2005; Jayaraj *et al*., 2016). Similarly, the usage of heavy metals such as arsenic (As), copper (Cu), lead (Pb), cadmium (Cd), nickel (Ni) and mercury (Hg) in different medicinal, industrial manufacturing, and agricultural sectors resulted in significant environmental discharge. Furthermore, radioactive wastes produced by nuclear power plants, industries, nuclear research facilities, or medical facilities emit hazardous ionizing radiation into the environment (Hatra, 2018). All these pollutants induce a variety of diseases or abnormalities in lower and higher animals, including humans, ranging from metabolic issues to reproductive failure, neurotoxicity, developmental disorders, and cancer (Brenner *et al*., 2003; Stewart *et al*., 2008; Briz *et al*., 2011; Alavanja and Bonner, 2012; Huang *et al*., 2019; Vardhan *et al*., 2019). Among the several pesticide chemical families, organophosphates, organochlorines, pyrethroids, and carbamates are the most well-known insecticides. Chlorinated pesticides such as benzene hexachloride (BHC), dichloro-diphenyl-trichloroethane (DDT), aldrin, hexachlorocyclohexane (HCHs), dieldrin, heptachlor, and others have long-lasting effects. During the 1940s and 1970s, pyrethroids were the most popular insecticides. However, their toxicity, persistence, and bioaccumulation in nontarget organisms were phased out and replaced by relatively less toxic compounds, carbamates, organophosphates, and pyrethroids compounds (Shen and Wania, 2005; Ritter, 2009; Hussain *et al*., 2009). Heavy metals such as Cd, Hg, Co, As, Pb, chromium (Cr), zinc (Zn), and Ni are required in different biological processes such as cell metabolism (Co), electron and oxygen transport (Cu and Fe), hormone and antioxidant production (Se), enzymatic activity (Mg). They have deleterious effects in all organisms (humans, animals, and plants) at low concentrations (Nagajyoti *et al*., 2010; Chibuike and Obiora, 2014; Ayangbenro and Babalola, 2017; Li *et al*., 2019). Heavy metals are extensively used in medicine (diagnostic imaging, drugs), industry (electric appliances, automobiles, machinery, tools, utensils), agriculture (fertilizers/biocides), and domestic infrastructure (buildings, bridges) due to their beneficial properties such as electrical conductivity, strength, and durability (Tchounwou *et al*., 2012). This results in their widespread presence in the environment. However, a strong affinity for sulfur (thiol group-SH), higher electro-negativity (hexavalent chromium), and lipid solubility (Hg) cause myeloma, CNS disorders, metabolic, and degenerative conditions/disorders in living organisms via various routes like occupational exposure in humans, bioaccumulate transfer (through food chain), and dermal absorption (Tchounwou *et al*., 2012; Pratush *et al*., 2018; Vardhan *et al*., 2019; Phian *et al*., 2022).

Agricultural plantations growing in unfavorable environments undergo various abiotic stresses due to heavy metals. These factors reduce plant growth as well as pose a threat to the plant population. Metal stress in soil reduces the

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Arbuscular mycorrhizal fungi and host-plant relationship with respect to heavy metal remediation of soil

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Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from Wastewater

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Abstract-**Reactive dyes which are mainly used for dyeing cotton and other cellulose-based fibers are released in huge quantities into water bodies. They are associated with several harmful effects including allergic dermatoses, respiratory diseases, colonic and rectal cancers, etc. In this paper, we report a novel and facile synthesis of bio-nanocomposite of magnetic guar gum (BMGG) wherein the polymeric network of guar gum is decorated with spinels of magnetic nanoparticles via a simple hydrothermal method which shows promising removal efficiency for reactive dyes. Physicochemical techniques such as FESEM, TEM, EDAX, FTIR, Raman, TGA, VSM, pHzpc, and XRD have been used for characterizing the as-synthesized nanocomposite. Batch adsorption studies carried out on BMGG showed rapid and excellent adsorption potential of the semi-synthetic material exhibiting a removal efficiency of up to 98.44 % within an hour with a maximum adsorption capacity of 526.32 mg g^{-1} for anionic Reactive green 19 dye from aqueous medium. The adsorption kinetics data fitted best into the pseudo-second-order model. Out of various isotherm models being studied such as Langmuir model, Freundlich and Temkin model, the adsorption equilibrium was found to be best described by the Langmuir isotherm model. The spontaneous as well as the exothermic nature of the adsorption phenomenon, is clearly evident from the thermodynamic studies. BMGG composites also showed significant regeneration capacity showing retention in adsorption efficiency even up to several cycles of adsorption-desorption process. Hence, the reported semisynthetic nanomaterial holds a good scope of playing a significant role in solving the perpetual challenge of water pollution.**

Keywords: **adsorption, kinetics, isotherms, reactive green 19, adsorption capacity**

1. INTRODUCTION

Over the last 10 years, researchers from various domains have been putting in relentless efforts in the field of exploration and design of sustainable materials that can be utilized as adsorbents for the removal of toxic contaminants from wastewater, most importantly synthetic dyes. Among several categories of dyes being synthesized, Reactive dyes are the ones that are used on an extensive scale. A Reactive dye primarily has chromophores containing an azo or anthraquinone moiety along with a number of other reactive groups such as an activated double bond (e.g., vinyl sulphone) or a heterocycle (e.g., trichloropyrimidine, chlorotriazine or difluorochloropyrimidine) (Mahmoud et al., 2007). Reactive dyes, owing to a multitude of advantages such as chemical stability, easy accessibility, fast and facile binding with the fabric, have been used on large scale for coloring cellulosic cotton fabric. Due to their chemical stability and high solubility in aqueous medium, these dyes are non-biodegradable due to which they pass untreated from the effluents through most of the conventional treatment methods (Özacar et al., 2013). Various basic parameters such as temperature, salt concentration, and alkaline condition along with the reactivity and diffusion coefficient of the dye play a crucial role in determining the dye fixation efficiency of reactive dyes on cellulosic fabrics (Hossain et al., 2020, Lee et al., 2019). Nevertheless, the efficiency of dye fixation on cellulosic fibers is considerably low varying from only 50-90%, which results in low absorption of these dyes on the fabrics. This, in turn, leaves a high content

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Hydrothermally Fabricated Bio-nanocomposite of Guar gum as a Promising Adsorbent for Reactive Green 19 Dye from Wastewater

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***Abstract*-Reactive dyes which are mainly used for dyeing cotton and other cellulose-based fibers are released in huge quantities into water bodies. They are associated with several harmful effects including allergic dermatoses, respiratory diseases, colonic and rectal cancers, etc. In this paper, we report a novel and facile synthesis of bio-nanocomposite of magnetic guar gum (BMGG) wherein the polymeric network of guar gum is decorated with spinels of magnetic nanoparticles via a simple hydrothermal method which shows promising removal efficiency for reactive dyes. Physicochemical techniques such as FESEM, TEM, EDAX, FTIR, Raman, TGA, VSM, pH$_{pzc}$ and XRD have been used for characterizing the as-synthesized nanocomposite. Batch adsorption studies carried out on BMGG showed rapid and excellent adsorption potential of the semi-synthetic material exhibiting a removal efficiency of up to 98.44 % within an hour with a maximum adsorption capacity of 526.32 mg g^{-1} for anionic Reactive green 19 dye from aqueous medium. The adsorption kinetics data fitted best into the pseudo-second-order model. Out of various isotherm models being studied such as Langmuir model, Freundlich and Temkin model, the adsorption equilibrium was found to be best described by the Langmuir isotherm model. The spontaneous as well as the exothermic nature of the adsorption phenomenon, is clearly evident from the thermodynamic studies. BMGG composites also showed significant regeneration capacity showing retention in adsorption efficiency even up to several cycles of adsorption-desorption process. Hence, the reported semisynthetic nanomaterial holds a good scope of playing a significant role in solving the perpetual challenge of water pollution.**

Keywords: **adsorption, kinetics, isotherms, reactive green 19, adsorption capacity**

1. INTRODUCTION

Over the last 10 years, researchers from various domains have been putting in relentless efforts in the field of exploration and design of sustainable materials that can be utilized as adsorbents for the removal of toxic contaminants from wastewater, most importantly synthetic dyes. Among several categories of dyes being synthesized, Reactive dyes are the ones that are used on an extensive scale. A Reactive dye primarily has chromophores containing an azo or anthraquinone moiety along with a number of other reactive groups such as an activated double bond (e.g., vinyl sulphone) or a heterocycle (e.g., trichloropyrimidine, chlorotriazine or difluorochloropyrimidine) (Mahmoud et al., 2007). Reactive dyes, owing to a multitude of advantages such as chemical stability, easy accessibility, fast and facile binding with the fabric, have been used on large scale for coloring cellulosic/cotton fabric. Due to their chemical stability and high solubility in aqueous medium, these dyes are non-biodegradable due to which they pass untreated from the effluents through most of the conventional treatment methods (Özacar et al., 2013). Various basic parameters such as temperature, salt concentration, and alkaline condition along with the reactivity and diffusion coefficient of the dye play a crucial role in determining the dye fixation efficiency of reactive dyes on cellulosic fabrics (Hossain et al., 2020, Lee et al., 2019). Nevertheless, the efficiency of dye fixation on cellulosic fibers is considerably low varying from only 50-90%, which results in low absorption of these dyes on the fabrics. This, in turn, leaves a high content

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Bibliometric Analysis of Peer-Reviewed Literature on Stress Factors Affecting Agricultural Productivity

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Abstract

Sustaining agricultural productivity is essential to ensuring food security. Climate change, increasing population and dwindling resources are factors of concern threatening crop productivity. Research across the globe have focused on seeking innovative measures to protect and enhance crop yield. We explored and analyzed peer-reviewed literature to provide an understanding of current and emerging trends in the field. A bibliometric method was followed using the database Scopus. Search queries used to retrieve documents were "Agriculture/crop productivity" and "Plant stress". The study period was restricted to the last five years, from 2017-2021. The search query found 2207 documents in Scopus under the agriculture and plant stress theme. Increasing growth of publications was observed in successive years. Research activities in this field have the most contributors from Asian countries – China and India followed by the US. The major stresses affecting agricultural productivity being investigated were-Water stress, Temperature stress, Salinity stress. Amongst these, the theme related to water stress/ precipitation/ drought stress was the most investigated. The availability of water has a pivotal role in sustainable agriculture. The use of conservation agricultural practices such as intercropping, no-tillage, and soil mulching has proven to be effective in retaining soil water content and reducing the dependency on irrigation, especially in rainfed areas, thereby assisting in drought mitigation and increasing crop yield. Precision agriculture approach employing satellite data to predict weather and rainfall and early detection of stress signals using hyperspectral reflectance has shown promising results in ensuring sustained productivity. Breeding and transgenic approaches for plants with higher water use efficiency (WUE) and the ability to tolerate water stress are key areas of research being followed throughout the world.

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Crop productivity;
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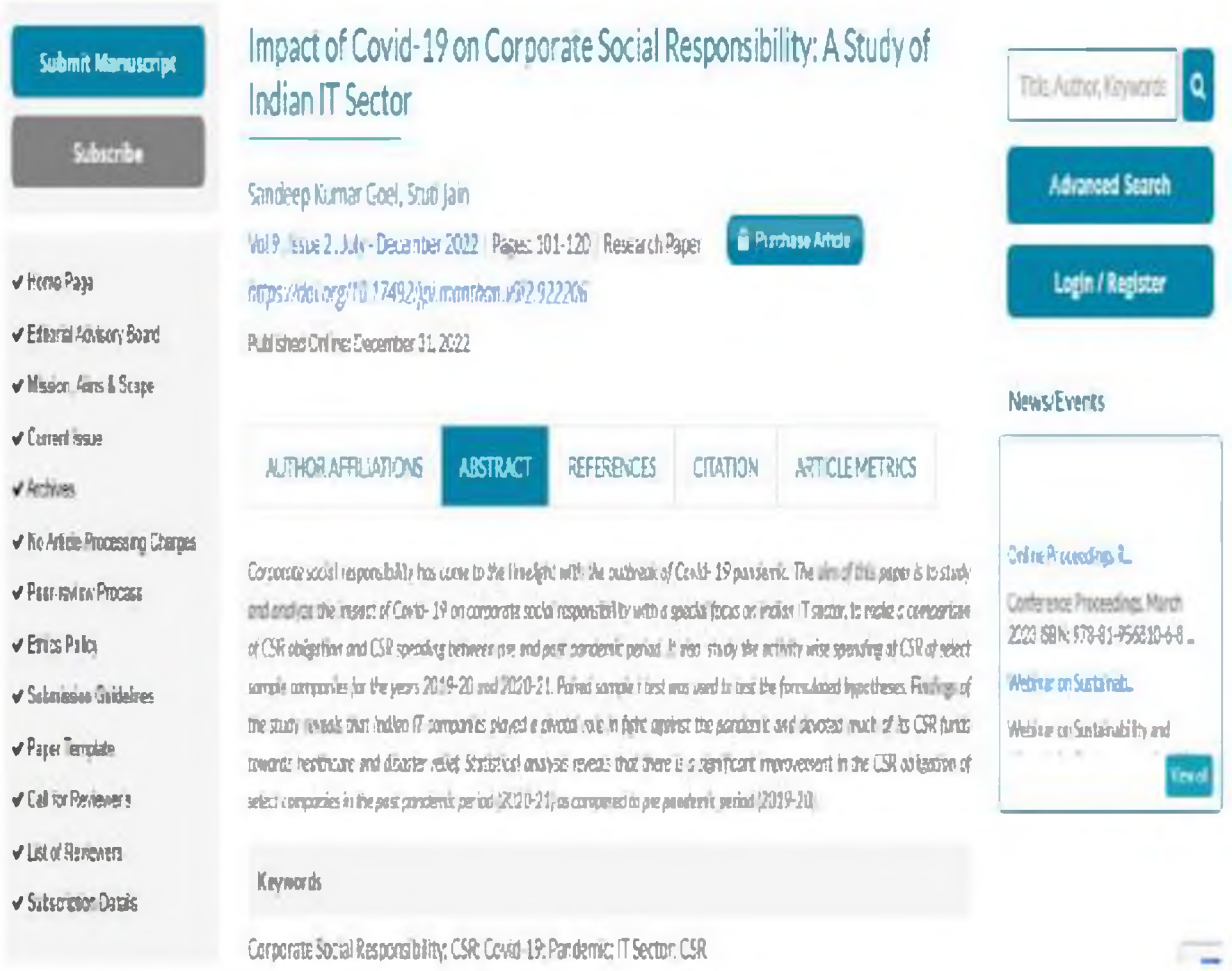
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Phool: Journey from Waste to Wealth

Dr. Surinder Kaur[1], Ms. Hanisha Bhagat[2], Ms. Parminder Kaur[3] and Mr. Nishant[4]

Abstract

With increasing awareness about sustainable living, there are many entrepreneurs who think of innovative sustainable business models but are hesitant to take the initial steps as they are sceptical about the challenges that they may have to face in the journey and where to look for the solutions. Thus, there is a need to document the journey of successful green businesses right from the point when the idea clicked to its transformation in to successful business, their triumphs and low points and what kept them going. This will not only serve to give recognition to these entrepreneurs for their work but will also guide upcoming entrepreneurs. The present work is in this direction. The present case study seeks to document the journey of Phool.co. The objective of the present case study is to examine unconventional business model adopted the company, identify the challenges faced by the company and explore strategies adopted by company to overcome these challenges, and its key success factors.

All the data and information for the study has been collected from the company's website, published interviews of its founders and key managerial personnel. The study revealed that company was able to succeed due to its unique packaging and marketing model. Its ability to innovate new green products such as florafoam, and fleather gave it recognition across the globe. The research findings about the way the founders of Phool toiled day and night and crossed initial hurdles regarding procurement of raw material, technological innovation, and securing finances for the project will certainly serve as a guide to other green entrepreneurs go wholeheartedly in their quest for sustainable living. In future, the work can be extended to comparative study of some more such start-ups to get better understanding of challenges faced by such entrepreneurs and how to resolve these.

Key Words: *Green Businesses, Sustainability, Zero waste solutions, Innovations in Business, Green Manufacturing Processes, Sustainable Business Models, Environment Protection, Eco-friendly Businesses*

1. Introduction

Green entrepreneurs in India are changing the basic network of production, marketing and consumption through eco-friendly concepts utilizing innovative product designs, raw materials, process design and marketing policies. They are the people who recognize the links between innovation and sustainability and thereby develop a comparative advantage for their firms/companies by selling differentiated products and services based on their environmental benefits. They are playing a crucial role towards sustainable economies not just by devising innovative production/marketing

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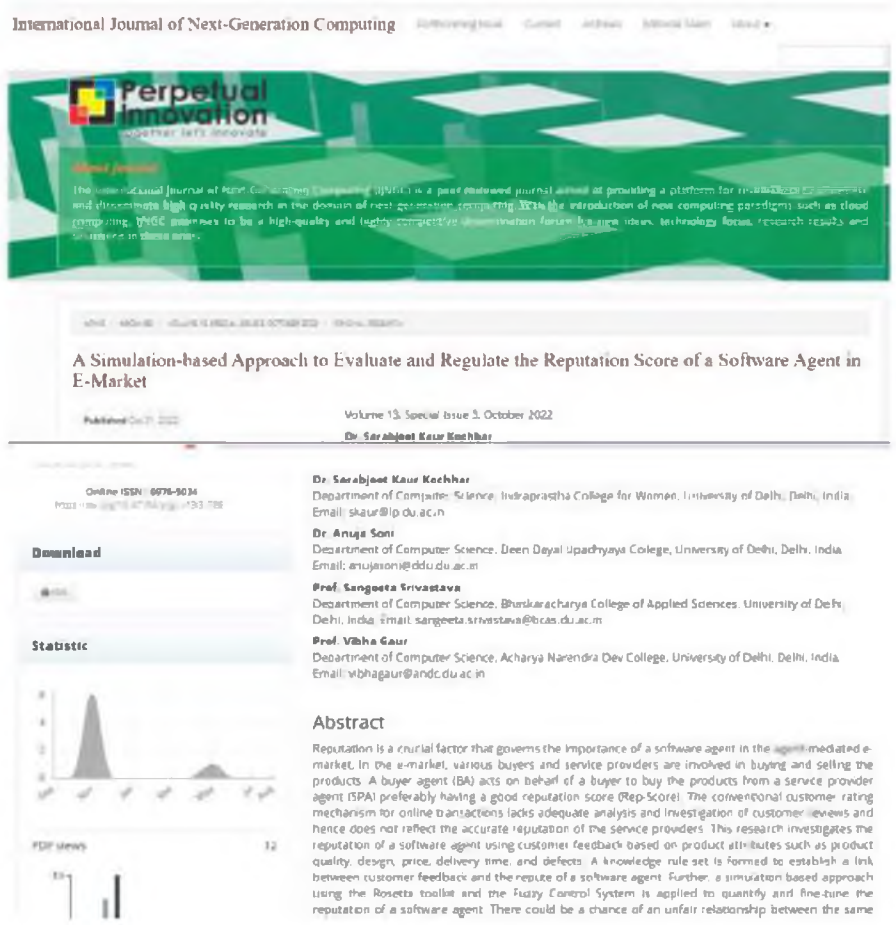

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Perpetual Innovation

A Simulation-based Approach to Evaluate and Regulate the Reputation Score of a Software Agent in E-Market

Volume 13, Special Issue 3, October 2022

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Abstract

Reputation is a crucial factor that governs the importance of a software agent in the agent-mediated e-market. In the e-market, various buyers and service providers are involved in buying and selling the products. A buyer agent (BA) acts on behalf of a buyer to buy the products from a service provider agent (SPA) preferably having a good reputation score (Rep-Score). The conventional customer rating mechanism for online transactions lacks adequate analysis and investigation of customer reviews and hence does not reflect the accurate reputation of the service providers. This research investigates the reputation of a software agent using customer feedback based on product attributes such as product quality, design, price, delivery time, and defects. A knowledge rule set is formed to establish a link between customer feedback and the repute of a software agent. Further, a simulation based approach using the Rosetta toolkit and the Fuzzy Control System is applied to quantify and fine-tune the reputation of a software agent. There could be a chance of an unfair relationship between the same

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(R1985) Study the Effect of Modified Newtonian Force on the Restricted 3-body Configuration in Non-Linear Sense

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MEASURING COMPLEXITY AND CHAOS IN THREE-SPECIES FOOD CHAIN SYSTEM WITH THE BEDDINGTON-DEANGELIS FUNCTIONAL RESPONSE

Sada Nand Prasad, I. M. Saha and Abdullah A. Ansari*

(*Received* 27 August 2020; *Revised* 8 April 2022)

Three species food chain system with the Beddington-DeAngelis Functional response investigated for regular and chaotic evolutions under different feasible conditions in the framework of nonlinear dynamics. The Eulers method employed to transform the continuous model into discrete model. A number of bifurcation plots obtained by varying certain system parameters in turn while keeping other parameters constant. These diagrams show clearly regular evolution followed by chaos for certain range of changing parameter. Regular and chaotic attractors obtained for different parameter spaces. Numerical calculations further extended to calculate Lyapunov exponents (LCEs), topological entropies and correlation dimensions of chaotic attractors for different sets of parameter values. Results of obtained are presented through graphics and tables and analysed properly.

1. Introduction

Most of the existing real phenomena in nature are nonlinear and their evolutionary dynamical behavior often displays properties like unpredictability, chaos and complexity. Because of these researchers are attracted to carry more investigations on real phenomena. Population dynamics and ecological system problems are among those studied frequently. Investigations relating to problems of interaction between ecological populations, such as consideration of two-species continuous or discrete time evolution systems, in form

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2010 Mathematics Subject Classification: 37G15, 37D45.

Key words and phrases: bifurcation, chaotic attractors, Lyapunov exponents, topological entropy, correlation dimension.

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Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population

Sharma Sneha[1], Pranav[1], Shivam[2], Rana Neha[1], Vashishtha Khushi[1], Chauhan Bhumika[1], Misra Monica[1]* and Sharma Bindu[3]

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Abstract: This study was aimed to investigate the long term change in quality of life post COVID-19 in all age groups from different parts of India. Three different survey methods were used to get in touch with COVID-19 survivors that included offline, online and telecommunication. Data was then categorized into three different categories as mild, severe and critical as per the level of severity of symptoms evaluated post-investigation. Individuals and area was treated as a random effect, with all covariates (age, sex, vaccination status, initial COVID-19 symptoms, level of severity of symptoms, time duration for which the symptoms lasted, post- recovery symptoms persisting more than 6 months, status of booster dose and safety precautions whether taken or not) treated as fixed effects. A total of 2600 individuals from various parts of India i.e. Delhi, Ghaziabad, Faridabad, Dehradun, Bangalore, Rajasthan, Tamil Nadu and Kerala were interviewed during the study. 602 positive cases were found with 255 individuals with mild symptoms, 273 severe symptoms, 72 critical cases and 2 special cases.

Results highlights the influence of COVID-19 on longer run, symptoms may resolve over time however, the influence of health on daily activities, work, and social activities may not. Through this communication we also highlights the fact that though COVID-19 has slowed down its infection rates but still precautions needs to be taken and various social programs should be organized to encourage people for booster dose.

Keywords: COVID-19, Symptoms, Health, Survey, Vaccination, Recovery, Precautions, Health

Citation: Sharma Sneha, Pranav, Shivam, Rana Neha, Vashishtha Khushi, Chauhan Bhumika, Misra Monica and Sharma Bindu: Post COVID-19 long term effects persisting more than 6 months in various age groups of Indian population. Intern. J. Zool. Invest. 8(2): 674-680, 2022.
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Introduction

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Results highlights the influence of COVID-19 on longer run, symptoms may resolve over time however, the influence of health on daily activities, work, and social activities may not. Through this communication we also highlights the fact that though COVID-19 has slowed down its infection rates but still precautions needs to be taken and various social programs should be organized to encourage people for booster dose.

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Post COVID-19 Long Term Effects Persisting More Than 6 Months in Various Age Groups of Indian Population

Sharma Sneha[1], Pranav[1], Shivam[2], Rana Neha[1], Vashishtha Khushi[1], Chauhan Bhumika[1], Misra Monica[1]* and Sharma Bindu[3]

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Re-characterization of Potential Zoonotic Trematode Parasite Parasitizing Intestine of Snakehead Fish, (*Channa striata*) Utilizing Multiple Sequence Alignment Tools (MSA)

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Abstract: Metacercariae of *Clinostomum* Leidy, 1856 are frequently encountered in freshwater fish. The species configuration and taxonomic antiquity of the genus *Clinostomum* has been very unsteady and under discussion. Two species, i.e. *Clinostomum complanatum* Rudolphi, 1814 and *Clinostomum marginatum* Rudolphi, 1819, have been specifically troublesome and their taxonomic validation has been debated. 19 human incidences of *Clinostomum complanatum* have been reported to cause pharyngitis and lacramalitis from Japan, Thailand and Korea. *Clinostomum marginatum* is commonly known as yellow grub as it causes pinhead sized lumps in fishes that are white to yellow or black. In the present communication, we have made use of cytochrome oxidase c subunit 1 gene as DNA barcode for validating the taxonomy of *C. complanatum* and *C. marginatum* harboring phylogenetic studies and multiple sequence alignment tools. Currently, in India species of this group are distinguished mainly on the basis of morphological characters that underlie possible confusions. Therefore, we disinterred the species through molecular analysis. The current findings are salient to authenticate the phylogenetic place and relationship among two trematode spp. and bypass misidentification regarding their validation, as it is more necessary in that case when many species harbours the same host and are of zoonotic importance.

Keywords: Zoonotic, Helminth, *Clinostomum complanatum*, Taxonomic, Cox1, molecular, *Clinostomum marginatum*

Citation: Chauhan Bhumika, Misra Monica and Sharma Bindu: Re-characterization of potential zoonotic trematode parasite parasitizing intestine of snakehead fish, (*Channa striata*) utilizing multiple sequence alignment tools (MSA). Intern. J. Zool. Invest. 8(2): 475-483, 2022.

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Introduction

The global aquaculture production has exceeded 91.4 million tons and generated an average income of more than US$ 145.4 billion (Aohagi *et al.*, 1992; Sosa *et al.*, 2016). Aquaculture has served as a prominent key factor in the economy of India. Increased parasitism and disease outbreaks have negative impacts not only on the fish production, but also leads to economic losses.

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Impact of Climatic Change on Respiratory Health

Jain Rajkumar[1], Aryama Priya[1], Chauhan Bhumika[1], Misra Monica[1]* and Saxena Tanushri[2]

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Abstract: Threatening effects of climate change are widely visible to the entire population. Though known to all, its adversity is understood only by a handful. With this study, we aimed to broaden its reach. Aiming at creating a louder voice of climate change, we wish to enlighten people about the adverse health effects it has in store for us. While reasons and results may be innumerable, yet precautions are few. Innumerable unknown repercussions have been approximated as well. Naturally occurring gases like carbon dioxide, nitrogen oxides and black carbon cause air pollution which aggravates allergenicity of plants causing earlier and longer pollen seasons. This worsens the situation for people already prone to asthma, allergens and other respiratory tract infections. Additionally, climate changes can exacerbate the issue evermore. Though the effects are perceptible, the reasons and cures are still being studied extensively.

Keywords: Climate, Pollution, Respiratory diseases, Asthma, COVID-19

Citation: Jain Rajkumar, Aryama Priya, Chauhan Bhumika, Misra Monica* and Saxena Tanushri: Impact of climatic change on respiratory health. Intern. J. Zool. Invest. 8(2): 973-982, 2022.

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Introduction

Climate change is a constantly aggravating situation which is hidden from none. The long-term effects which lead to changes in temperature and rainfall patterns are appertained to climate change. It is a global havoc created by man-made interventions. A change in climate has caused widespread problems and has put earth's ecosystem and life of unborn generations in trouble. The visible effects have grown dramatically over the past few years and it has been estimated that it will grow fourfold in the next ten years if the present rates of deterioration continue. As per UN reports, an increase of 1.5°C in global temperature would help maintain survivable conditions but an estimate of 3.2°C increase has been drawn based on current climate plans.

Contrary to popular belief, climate change is not only about rising temperatures. It encapsulates fervent droughts, famine, dreadful

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PCR primer design for mitochondrial cox-1 gene from *Clinostomum complanatum* towards diagnosis

Monica Misra[1], Bhumika Chauhan[1], K.M. Deepika[2], A. Madhuri[3] & Bindu Sharma[4,*]

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REVIEW ARTICLE

A Literature Review on Reckless and Hazardous Contraceptive Practices used since Primeval Times

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ABSTRACT

Historians have extrapolated that primitive society used a diversity of methods to restrain populations such as physical segregation of men and women, infanticide and rallying of practices that would prevent pregnancies. The lack of education, perceived stigma from friends, alienation from parents and stringent financial implication were some of the utmost reasons considered as major drawback that leads to unplanned pregnancies and turning out with severe deadly consequences. The authors in the present communication accentuates the usage of harmful elements like lead, arsenic , plastic bags, oils , honey ,etc as method of contraception in ancient times that was absolutely not only myths but also hazardous. The utility of few herbal plants had already proved to have 100% effectiveness on birth control in distinct animal groups but still there usage remains unseasoned in humans. The authors also spotlights on the fact that certain authentic research is still needed to substantiate the use of herbs as natural mode of birth control as the present day practices of oral contraceptives (OC) retain hormonal imbalances and side effects.

Keywords: Contraceptive , women , fertility, birth control , sperm, human.

INTRODUCTION

In spite of the accessibility of secure and potent forms of contraception till today, societies in both developing as well as the developed world endure from unsatisfactory elevated rates of coincidental and nasty pregnancies. Though much progress has been made in recent decades in fertility abstraction in developing countries but still around 120 million (10–12%) married women in many regions and also more than 24% in sub-Saharan Africa, persevere to report an envious demand for contraception(Sirtuk Ware *et al.*,2013).The expeditious hike in the population growth has remarkably expanded the number of individuals per family and many cases of serious shortage of food and shelter have been reported that eventually leads to high maternal and infant mortality.

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RESEARCH ARTICLE

Role of A Evolutionary Conserved Hypothalamic Neuropeptide: Neuropeptide Y (NPY) in Release of Gonadotropin and Anterior Pituitary Hormones in Different Animal Groups

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ABSTRACT

The neuroendocrine control of gonadotropin secretion is attained by the ensemble of Luteinizing Hormone Releasing Hormone (LHRH) secreting neurons that are distributed within the anterior hypothalamus. These neurons are the main element of hypothalamo-hypophysiotropic association and their activity in turn is modulated by neurotransmitter or peptidergic synaptic inputs. In recent years, considerable attention has been focused to evaluate the role of neuropeptides that have been identified in the Central Nervous System (CNS) especially in the hypothalamus. Some of the neuropeptides of the hypothalamus modulate the release of LHRH and which in turn regulates the LH release. One such peptide released from the hypothalamus is Neuropeptide- Y, that acts as both neurotransmitter and neurohormone with multiple diverse effects like stimulation of feeding, inhibition of sex behaviours and modulation of cardiovascular parameters .Its role has also been found in severe stress and pathogenesis of bulimia ,low renin hypertension and in Alzheimer's disease which further signifies the importance of its study. NPY shows high degree of conservation throughout evolution .The present review is on the effect of Neuropeptide- Y on the levels of GnRH with major effects on LHRH .

Keywords: neuropeptide , hypothalamus , NPY , neurons , LHRH , LH ,FSH ,GnRH.

INTRODUCTION

Neuropeptides are small sized disparate group of hypothalamic signaling molecules that plays a significant role in communication among the cells in the central nervous system (CNS) and also a crucial role in cell-to-cell

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RESEARCH ARTICLE

Role of A Evolutionary Conserved Hypothalamic Neuropeptide: Neuropeptide Y (NPY) in Release of Gonadotropin and Anterior Pituitary Hormones in Different Animal Groups

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ABSTRACT

The neuroendocrine control of gonadotropin secretion is attained by the ensemble of Luteinizing Hormone Releasing Hormone (LHRH) secreting neurons that are distributed within the anterior hypothalamus. These neurons are the main element of hypothalamo-hypophysiotropic association and their activity in turn is modulated by neurotransmitter or peptidergic synaptic inputs. In recent years, considerable attention has been focused to evaluate the role of neuropeptides that have been identified in the Central Nervous System (CNS) especially in the hypothalamus. Some of the neuropeptides of the hypothalamus modulate the release of LHRH and which in turn regulates the LH release. One such peptide released from the hypothalamus is Neuropeptide- Y, that acts as both neurotransmitter and neurohormone with multiple diverse effects like stimulation of feeding, inhibition of sex behaviours and modulation of cardiovascular parameters .Its role has also been found in severe stress and pathogenesis of bulimia ,low renin hypertension and in Alzheimer's disease which further signifies the importance of its study. NPY shows high degree of conservation throughout evolution .The present review is on the effect of Neuropeptide- Y on the levels of GnRH with major effects on LHRH .

Keywords: neuropeptide , hypothalamus , NPY , neurons , LHRH , LH ,FSH ,GnRH.

INTRODUCTION

Neuropeptides are small sized disparate group of hypothalamic signaling molecules that plays a significant role in communication among the cells in the central nervous system (CNS) and also a crucial role in cell-to-cell

Monkeypox: Endemic to Epidemic
A review of the current scenario of Monkeypox disease outbreak

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Abstract - The recent outbreak of Monkeypox disease in different parts of the world has drawn attention and concerns of the scientific communities, medicine world and the governments. The world has witnessed what havoc a virus can cause if it jumps from an animal to human beings. Are we moving towards the next pandemic? How safe are the use of animals in medicine and biological research? What will be the consequence of this new zoonotic disease? To avoid another pandemic, it is important that we watch the progress of this disease closely and understand the causes, consequences, treatment, and possible control before it gets out of hands. This article is a compilation of all the information about Monkeypox disease that is available in different domains, to give an overview of the current scenario of the disease.

Index Terms – Monkeypox, virus, MPV, epidemiology of MPV

I. INTRODUCTION

Monkeypox is a viral, zoonotic (transmitted to human from animals), and rare disease that is caused by infection with monkeypox virus (MPV or MPXV) with symptoms close to smallpox but not as severe as smallpox. Monkeypox was first discovered in 1958, when outbreaks of a pox-like disease occurred in monkeys used for research. About a few thousand cases occurred in Africa especially in central and western parts of the African continent [1]. The cases outside Africa were limited to a small number with a travel history of people visiting Africa or with the import of the infected animals.

In 1970, the Democratic Republic of the Congo reported the first human case of monkeypox. Since then, many cases have been reported from various central and west African countries. Most cases are reported from poorest and most marginalized communities in the world [2][3]. Incidents of MPV infections are on a rise since early May 2022. About 19 countries across the world have reported confirmed or suspected cases of monkeypox to the WHO. Since the reports are from different parts of the world, this can no longer be considered endemic to the African region [14].

The cases detected outside the endemic places in the early May 2022 has surpassed the total number detected and this rapid spread has put the scientists worldwide on high alert. There has been a sudden and unexpected occurrence of monkeypox simultaneously in many non-endemic countries, which suggests that there is a possibility of some undetected transmissions for an unknown duration of time followed by recent amplifying events [14].

Epidemiological investigations are going on, however, from the various cases that are reported, so far, no established travel links to endemic areas has been established. Based on currently available information, a unique observation has been established which highlights the possibility of the spread of the disease, mainly but not exclusively, amongst men who have sex with men (MSM) and are seeking primary care in primary clinics or sexual health clinics. A scientific clinical link has yet to be established.

II. WHAT IS MPV?

Monkeypox virus is a double stranded DNA virus which belongs to genus *Orthopox virus* belonging to the Poxviridae family. The *Orthopox virus* genus also includes variola virus responsible for smallpox and cowpox virus. Various animal species have been known to be susceptible to the monkeypox virus. The natural reservoir of monkeypox has been a question of interest from many scientists since its discovery. However, it has been detected from rodents of African region, non-hominids primates such as monkey (hence the name "Monkeypox"). Further research is needed to know the exact reservoir/s of the virus and the route of its entry into the human population.

III. PATHOGENESIS

Pathogenesis is the progression of an infection which leads to disease. The general viral pathogenicity includes (a) implantation of virus at the portal of entry, (b) viral replication in the host cell [3], spread of viral agent to target organs causing the disease and (c) migration of virus to sites of shedding into the environment.

Factors that affect the pathogenic mechanisms are (a) accessibility of host tissue to the virus (b) host cell susceptibility to virus multiplication, and (c) virus susceptibility to host defences. Low-virulent strains of pathogenic virus strains are favoured by natural selection forces.

In case of monkeypox, infection may begin from the respiratory epithelium or the dermis. The virus further progresses and enters the lymphatic system leading to the swelling of the lymph nodes. Other organs that are susceptible to infected are mucus lining of nose and buccal cavity.

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IN VITRO MICROPROPAGATION OF *ACACIA HOLOSERICEA* A. CUNN. EX G. DON THROUGH COTYLEDONS

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Abstract

Cotyledonary explants were excised from 15-day-old seedlings of *Acacia holosericea* A. Cunn ex G. Don and cultured on B_5 medium supplemented with different growth regulators. Caulogenesis was observed both directly and indirectly in different cytokinin adjuvanted media. Of all the cytokinins tested, zeatin supported maximum multiple shoot differentiation. Friable to compact nodular green calluses developed at cut ends of explants and on their surface within 15-20 days of inoculation. Caulogenesis was observed only after 40-45 days of initial culture, and an average of 4.3±2.7 shoots per explant were formed on 2.5 mg/l zeatin containing B_5 medium in 40% of explants. The addition of 200 mg/l Ad.S enhanced the percentage of explants forming shoot buds to 50 and raised the number of shoot buds per explant to 12.0±6.8. Cent percent of the *in vitro* raised shoots when excised and subcultured on B_5 basal medium, developed roots directly at their base.

Keywords: *Acacia Holosericea*, Cotyledons, Fabaceous Tree, Micropropagation.

Abbreviations: Ad.S., Adenine Sulphate; B_5, Gamborg Et Al Medium; BA, N^6-Benzyladenine; 2ip, (6-Dimethyl Allylamine)-Purine; Kn, Kinetin.

Introduction

The last three decades have witnessed a large proportion of forests being denuded. The availability of land for crop production is gradually shrinking at an alarming rate due to industrialization, urbanisation, etc. The environment has been strikingly degraded both in rural and urban areas. Maintenance of higher living standards, obviously, always craving for much more than required consumption of natural resources have been the chief cause for environmental degradation in the urbanised world, whereas it is poverty and overpopulation in rural areas which have led to the degradation of the environment in the developing countries. Hence, reforestation is an urgent priority for mitigating such hazardous and catastrophic developments. This can be done by planting trees that are multipurpose, fast-growing, high-yielding, capable of withstanding abiotic and biotic stresses, resistant to diseases and pests as well as have the ability to fix atmospheric nitrogen directly, ultimately acting as artificial fertilisers[1][2]. Some such woody species are the leguminous trees, whose potential has been recognized the world over. There has been a conspicuous lacuna in the axenic morphogenesis due to their recalcitrant nature under *in vitro* conditions. However, it has now been possible to micropropagate some of the most valuable woody legumes such as *Acacia*, *Albizia*, *Dalbergia*, *Prosopis*, etc.

Acacia holosericea A. Cunn. Ex G. Don, is a native of Australia and was introduced in India for afforestation projects. It is a small tree, well adapted to a wide range of harsh habitats in arid lands, and plays a significant role in the revegetation of denuded lands. The tree grows well even under environmentally stressed conditions such as water scarcity, low nutrients and high levels of salinity. It is also known to be responsible for altering the soil microbiota by modifying the structure of Arbuscular Mycorrhizal fungal communities [3]. Besides being adaptable to arid regions, it is often grown as an ornamental tree [4]. This tree taxon has appreciably high productivity, useful for biochar, bio-oil and biogas production [5]. It grows profusely which makes it not only suitable but also important for introduction in Indian deserts [6]. The present study reports micropropagation of *A. holosericea* through the cotyledonary explants.

Materials and methods

Seeds of *Acacia holosericea* were soaked in concentrated sulphuric acid for 30 min. and surface sterilised by treating with freshly prepared chlorine water for 45 min. Chlorine was obtained by adding 30 ml of concentrated hydrochloric acid (LR) to 4 g of potassium permanganate. The chlorine water was prepared by bubbling chlorine in 500 ml of distilled water for 15-20 min. Thereafter, the seeds were washed thrice with sterilised water and implanted aseptically on semi-solid Knop's medium [7].

Cotyledons were excised from 15-day-old *in vitro* raised seedlings and cultured on B_5 [8] medium either alone or supplemented with growth regulators such as cytokinins and/or auxins. In addition, a few adjuvants such as adenine sulphate and coconut water were also tried.

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AXENIC PROPAGATION OF A WOODY LEGUME - PROSOPIS CINERARIA (L.) DUCE THROUGH COTYLEDONARY NODE EXPLANTS

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Abstract: Cotyledonary node explants of Prosopis cineraria (L.) Duce were excised from 10-day-old seedlings grown in vitro on Knop's medium [1] and cultured on Murashige & Skoog medium [2] supplemented with various cytokinins like N^6-benzyladenine, (6-dimethyl allylamine)-purine, kinetin or zeatin. Maximum number of shoots developed in 63% explants on 11µmol (2.5mg/l) N^6-benzyladenine adjuvanted MS medium after 60 d of culture. The adventive shoots differentiated in the axil of cotyledons. 89% shoots formed roots within 20-25d when subcultured on MS medium supplemented with 13.2µmol (3mg/l) indole-3-butyric acid. The plants developed in vitro were gradually transferred to the soil.

Keywords: Cotyledonary Node, Fabaceous Tree, Micropropagation, Prosopis Cineraria.

Abbreviations: AC, activated charcoal; B_5, Gamborg et al.'s medium; BA, N^6-benzyladenine; 2iP, (6-dimethyl allylamine)-purine; F.A.A., Formalin-acetic acid-alcohol; IAA, Indole-3-acetic acid; IBA, Indole-3-butyric acid; Kn, Kinetin; MS, Murashige & Skoog medium; NAA, α-Naphthalene acetic acid; NOA, β-Naphthoxyacetic acid.

Introduction

Micropropagation of trees is being increasingly recognised as a potential bypass technology for rapid afforestation to achieve enhanced biomass production. In addition, it offers means not only to conserve elite and rare tree germplasm but also for bringing about their genetic improvement. Prosopis is an important multipurpose fabaceous tree of arid tropics and has several species of value, predominant in the Thar desert. Though considered as a problematic and recalcitrant species to in vitro regeneration, during the past few years, a few reports with limited success have appeared employing both juvenile and mature explants [3,4,5].
The present investigations were undertaken to develop a protocol for micropropagation of a fabaceous taxon Prosopis cineraria, which is one of the two tree species that serve as lifeline for inhabitants of drier regions of Rajasthan in India.

Material and Methods

Seeds of Prosopis cineraria belonging to subfamily Mimosoideae were obtained from the Central Arid Zone Research Institute, Jodhpur, India. They were scarified and soaked in distilled water for 8hr at room temperature and surface sterilized with freshly prepared chlorine water (3.5±0.5mg/l) for 45min. Chlorine was obtained by addition of 30ml of concentrated hydrochloric acid to 4g of potassium permanganate. The chlorine water was prepared by bubbling chlorine in 500ml of distilled water for 15-20min. Thereafter, the seeds were washed three times with sterilized distilled water and germinated aseptically on Knop's medium containing 2% sucrose (British Drug House, Poole, England) and 0.8% agar (Hi-media, Mumbai, India). The pH of media was set at 5.8 before autoclaving at 121°C at 1.06 kg/cm^2 pressure for 15min.

About 0.8-1cm long segments of cotyledonary node were excised from 10-day-old seedlings and cultured on MS basal medium alone as well as adjuvanted with cytokinins (BA, Kn, 2iP or zeatin) at 0.5 to 3mg/l levels. The media contained 3% sucrose and 0.8% agar. Cultures were maintained at 25±2°C and 55±10% relative humidity under white fluorescent light at 40µ cEm^{-2}s^{-1} irradiance emitted by 40W Crompton incandescent tubes programmed for 16 hr photoperiod. Explants were subcultured on a fresh medium after every 25-30 days and data were recorded at an interval of 10-15d. The final data were scored after 60d of culture. The in vitro reared shoots were excised and reared on MS medium supplemented with 1-3mg/l auxins (IAA, IBA, NAA or NOA) for root induction. A minimum of 30 replicates were raised for each treatment and all experiments were repeated at least once. The average number of shoots per responding explant has been represented as mean value indicating the standard deviation (mean±S.D).

For histological studies, tissues were fixed in F.A.A. and dehydrated through a graded ethanol-xylene series, followed by infiltration and embedding in paraffin wax. Serial sections, 20-25µm thick, were cut with a rotary microtome and affixed to slides. These were dewaxed, stained with safranin-fast green combinations, dehydrated and mounted in canada balsam. Photomicrographs were taken by a 35mm camera attached to the Leitz Orthoplan Universal Microscope.

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Research Article

SYNTHESIS, CHARACTERIZATION AND APPLICATION OF NOVEL GUAR GUM-N,N-DIMETHYLANILINE RESIN FOR WASTE WATER TREATMENT

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ABSTRACT

The polymeric ion exchange resin has found extensive applications in recovery and removal of transition metal ions from process solutions due to their selectivity particularly against alkali metal ions. The ion exchanger based on guar gum is hydrophilic and biodegradable, whereas ion exchangers prepared from petrochemical products are hydrophobic and not biodegradable. Its cost is low, locally available in large quantities from agricultural resources and is environment friendly. N,N-Dimethylaniline group has been incorporated in Guar gum based polysaccharide by a modified Porath's method of functionalization of polysaccharide in order to develop a hydrophilic, flocculants cum ion exchanger. The characterization of synthesized resin [GGMA] was carried out by FT-IR spectrum, moisture content, ion exchange capacity, solubility of resin in different solvent, resin durability and elemental analysis. The adsorption of different metal ions on GGMA resin follows the order: $Fe^{3+} > Cu^{2+} > Zn^{2+} > Cd^{2+} > Pb^{2+}$. The adsorbency of different metal ions on GGMA resin was studied up to 10 cycles. The effects of pH, treatment time, treatment temperature, and resin dose on the removal of metal ions from industrial effluent were also studied. The GGMA resin was found to be applicable for the removal and recovery of heavy metal ions from Faridabad ground water.

INTRODUCTION

Water pollution due to hazardous heavy metals has been a major global concern for us. Heavy metal ions not only reach surface water but also contaminate ground water in trace amounts by leaching from soil after rain. Heavy metals are detected in ground water. Water pollution affects plants and animals living in these bodies of water as well as human communities that use the polluted water. The removal of heavy metal ions from waste water can be achieved by several processes, such as precipitation, solvent extraction, chemical, electrochemical techniques[1] and advanced oxidation process[2]. The presence of lead, cadmium and other heavy metals ions in the environment has become a major threat to plant, animal and human life due to their bioaccumulations tendency and toxicity, therefore must be removed from municipal and industrial effluents before discharge.

A number of chelating ion exchange resins have been produced by resin manufacturers to overcome this problem and to encourage ion exchange to a broader range of processing solutions using high capacity cation and anion exchange resins with metal complexing effluents[3,4].

The separation of many transition and post transition metals was accomplished using various ion exchange resins [5]. Ion exchange method during the last decade has become increasingly important in various analysis in organic and inorganic chemistry [6-8]. Ion exchange process has been recognized as a powerful tool in separation, purification and metal recovery systems. The process involves a reversible exchange of ions which takes place between liquid and solid phase of ion exchangers during two sequential processes, adsorption/metal loading and elution. Adsorption/metal loading is interpreted as the extraction process in which the targeted ions from the liquids are exchanged with mobile ions from the ion exchangers [9]. The interest in the chelating resins or ion exchange resins is due to the rapid adsorption of metal ions, higher selectivity and less swelling, in comparison with the analogous organic polymer. Chemically, guar gum (Figure 1) is a polysaccharide composed of the sugars galactose and mannose. The backbone is a linear chain of β 1, 4-linked mannose residues to which galactose residues are 1, 6-linked at

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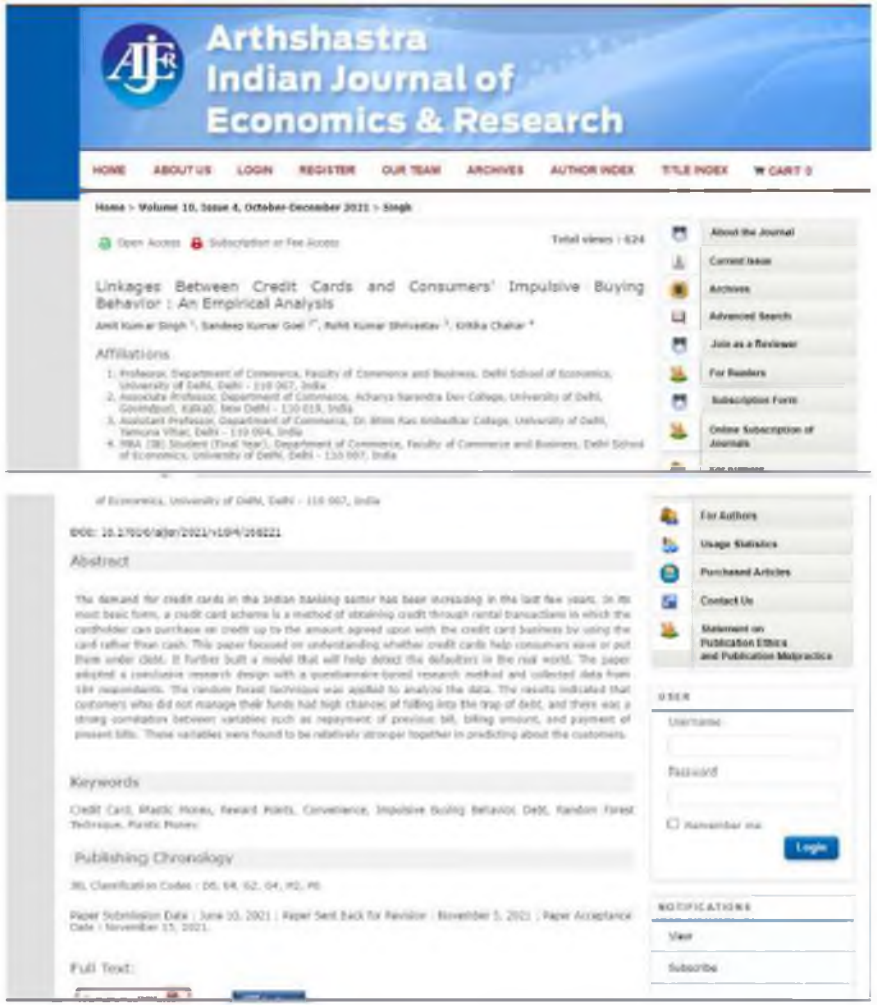
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Review

Antibiotic Resistance: A Global Health Crisis

Renu Solanki[1] · Shailly Anand[1] · Mugdha Anand[2] · Prateek Kumar[1] · Munendra Kumar[1] · Monisha Khanna Kapur[3]*

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Abstract

Antimicrobial Resistance (AMR) has been recognized as a global health crisis. It occurs when the microbial pathogens develop mechanisms by means of which the existing antibiotics become ineffective against them and the management of infections caused by them become difficult. According to the data of World Health Organization (WHO) the most common multidrug resistant (MDR) microbes include *Mycobacterium tuberculosis*, *Neisseria gonorrhoeae*, *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Pseudomonas aeruginosa*, *Clostridium difficile*, *Klebsiella pneumoniae* and many more. Overpopulation, globalization, misuse of antibiotics by humans, injudicious use of antibiotics in livestock, poor hygiene standards in hospitals and lack of development of new antibiotics constitute the major causes for the rise in antimicrobial resistance. Although, the development of new antibiotics is considered as a potential solution to tackle the spread of AMR; newer alternative strategies including vaccines, bacteriophages, monoclonal antibodies, other bioactive molecules like peptides and development of effective diagnostic tools are also being explored by scientists to overcome this issue. This global concern thus requires collaborative efforts from countries across the world. Therefore, different organizations like World Health Organization (WHO), Centers for Disease Control and Prevention (CDC), Infectious Diseases Society of America, World Economic Forum are working tirelessly towards the control of AMR.

Keywords: Antibiotics, anti-microbial resistance, health, global challenge

Introduction

Antibiotics are the chemical substances which kill or stop the growth of microbes including bacteria and fungi. On the basis of their mode of action, antibiotics are divided into two broad categories [1]:

(i) Bacteriostatic: These antibiotics prevent the bacteria from multiplying further mainly by hampering the cell wall synthesis.

(ii) Bactericidal: These antibiotics kill the bacteria by preventing the DNA replication, protein synthesis or by affecting other metabolic pathways (Figure 1).

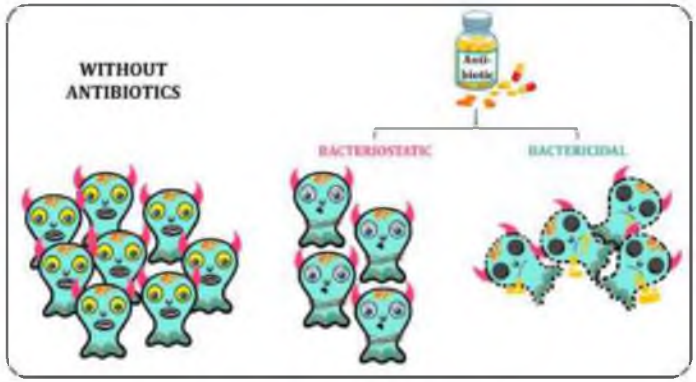

Figure 1: Bacteriostatic and Bactericidal antibiotics

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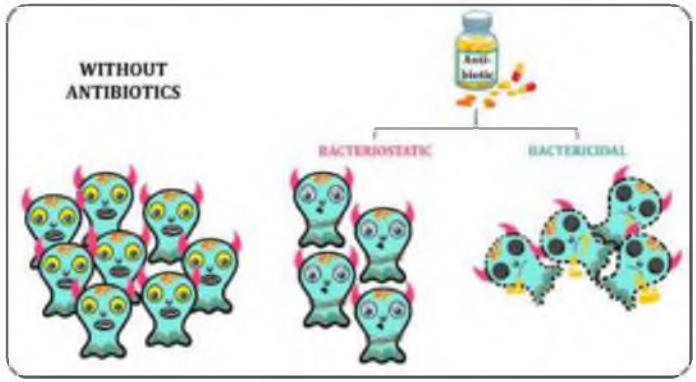

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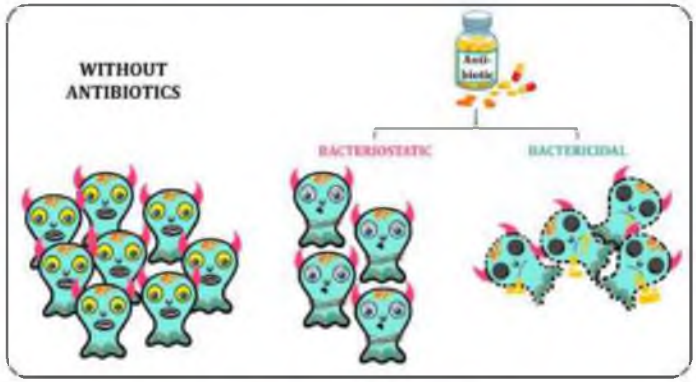

Figure 1: Bacteriostatic and Bactericidal antibiotics

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Review

Role of abiotic and biotic components in remediating environmental pollutants: A review

Sripoorna Somasundaram[1] · Jyoti Dagar[1] · Jeeva Susan Abraham[1] · Swati Maurya[1] · Sandeep[1] · Seema Makhija[1] · and Ravi Toteja[1]*

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Research Article

Estimation after selection from bivariate normal population with application to poultry feeds data

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[2] Department of Statistics and Operations Research, Aligarh Muslim University, Aligarh, India
[3] Department of Mathematics, Acharya Narendra Dev College, University of Delhi, Delhi, India
[4] Department of Mathematics and Statistics, Central University of Punjab, Bathinda, India

Abstract

In many practical situations, it is often desired to select a population (treatment, product, technology, etc.) from a choice of several populations on the basis of a particular characteristic that associated with each population, and then estimate the characteristic associated with the selected population. The present paper is focused on estimating a characteristic of the selected bivariate normal population, using a LINEX loss function. A natural selection rule is used for achieving the aim of selecting the best bivariate normal population. Some natural-type estimators and Bayes estimator (using a conjugate prior) of a parameter of the selected population are presented. An admissible subclass of equivariant estimators, using the LINEX loss function, is obtained. Further, a sufficient condition for improving the competing estimators is derived. Using this sufficient condition, several estimators improving upon the proposed natural estimators are obtained. Further, an application of the derived results is provided by considering the poultry feeds data. Finally, a comparative study on the competing estimators of a parameter of the selected population is carried-out using simulation.

Mathematics Subject Classification (2020). 62F07, 62F15, 62C15

Keywords. Estimation after selection, bivariate normal distribution, improved estimators, LINEX loss function, natural selection rule

1. Introduction

The estimation of a characteristic after selection has been recognized as an important practical problem for many years. The problem arises naturally in multiple applications where one wishes to select a population from the available $k\,(\geq 2)$ populations and then estimate some characteristics (or parametric functions) associated with the population selected by a fixed selection rule. For example, in modeling economic phenomenons, often the economist is faced with the problem of choosing an economic model from $k\,(\geq 2)$ different models that returns a minimum loss to the capital economic. After the selection

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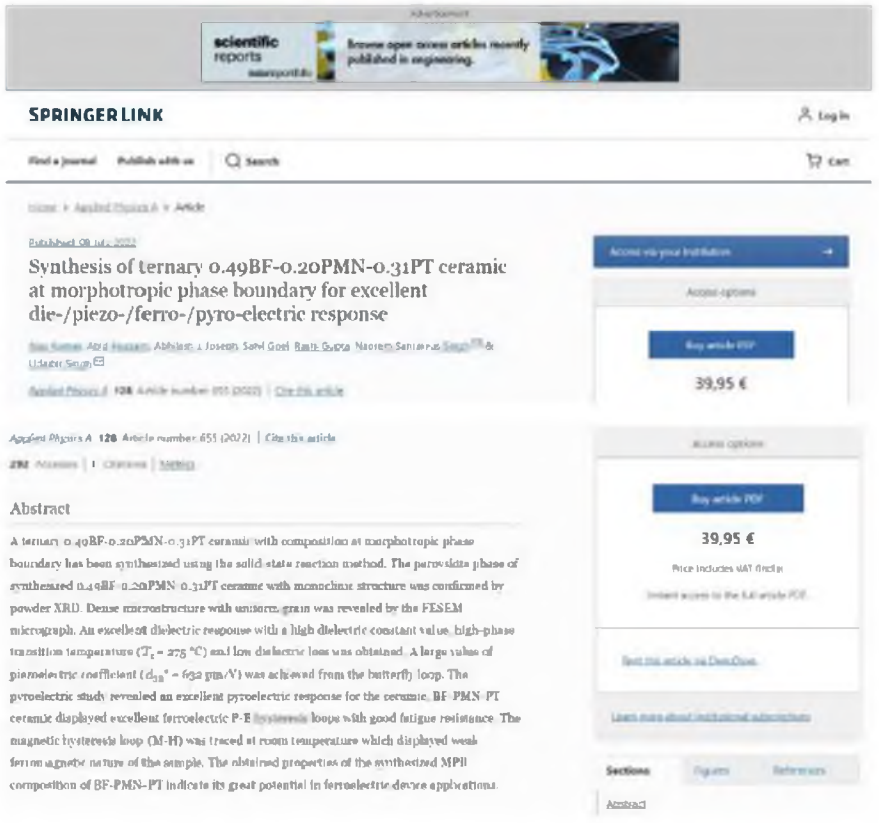
Surface texturisation for the reduction of light reflection in ZnO/Si heterojunction
ABSTRACT
In this paper, the impact of pyramidal texture on a silicon substrate in ZnO/p-Si heterojunction was investigated. The texturisation of p-type silicon (100) substrate was obtained using the KOH anisotropic wet chemical etching method for different etching times. The RF magnetron sputtering technique was used to deposit ZnO thin films on textured Si substrates and planar Si substrates to form ZnO/Si heterojunction. The surface morphology was studied with field emission scanning electron microscopy (FE-SEM) and atomic force microscopy (AFM). Optical properties were investigated using UV-Visible spectroscopy and photoluminescence (PL). The results show that the PL intensity in the visible region of the electromagnetic spectrum increases with the etching time, while a significant reduction is observed in the reflectance. Due to impressive anti-reflection response, ZnO/Si (textured silicon-TS) heterojunction can be effective in improving the efficiency of solar cells.
Related Research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Abstract
A ternary 0.49BF-0.20PMN-0.31PT ceramic with composition at morphotropic phase boundary has been synthesized using the solid state reaction method. The perovskite phase of synthesized 0.49BF-0.20PMN-0.31PT ceramic with monoclinic structure was confirmed by powder XRD. Dense microstructure with uniform grain was revealed by the FESEM micrograph. An excellent dielectric response with a high dielectric constant value, high-phase transition temperature (T_c = 275 °C) and low dielectric loss was obtained. A large value of piezoelectric coefficient (d_{33}* = 632 pm/V) was achieved from the butterfly loop. The pyroelectric study revealed an excellent pyroelectric response for the ceramic. BF-PMN-PT ceramic displayed excellent ferroelectric P-E hysteresis loops with good fatigue resistance. The magnetic hysteresis loop (M-H) was traced at room temperature which displayed weak ferromagnetic nature of the sample. The obtained properties of the synthesized MPB composition of BF-PMN-PT indicate its great potential in ferroelectric device applications.
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Review

Recent Trends in Carbon Nanotube Electrodes for Flexible Supercapacitors: A Review of Smart Energy Storage Device Assembly and Performance

Himadri Tanaya Das [1,*], Swapnamoy Dutta [2], Tamilarasan Elango Balaji [2], Nigamananda Das [2], Payaswini Das [3], Neelu Dheer [4], Rajni Kanojia [5], Preety Ahuja [6] and Sanjeev Kumar Ujjain [6,*]

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Abstract: In order to upgrade existing electronic technology, we need simultaneously to advance power supply devices to match emerging requirements. Owing to the rapidly growing wearable and portable electronics markets, the demand to develop flexible energy storage devices is among the top priorities for humankind. Flexible supercapacitors (FSCs) have attracted tremendous attention, owing to their unrivaled electrochemical performances, long cyclability and mechanical flexibility. Carbon nanotubes (CNTs), long recognized for their mechanical toughness, with an elastic strain limit of up to 20%, are regarded as potential candidates for FSC electrodes. Along with excellent mechanical properties, high electrical conductivity, and large surface area, their assemblage adaptability from one-dimensional fibers to two-dimensional films to three-dimensional sponges makes CNTs attractive. In this review, we have summarized various assemblies of CNT structures, and their involvement in various device configurations of FSCs. Furthermore, to present a clear scenario of recent developments, we discuss the electrochemical performance of fabricated flexible devices of different CNT structures and their composites, including additional properties such as compressibility and stretchability. Additionally, the drawbacks and benefits of the study and further potential scopes are distinctly emphasized for future researchers.

Keywords: carbon nanotubes; flexible; energy storage; supercapacitor; nanocomposites

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1. Introduction

Development of flexible energy storage systems has improved in recent times, due to the rise in demand for next-generation technology. Recent technologies such as smart wearable and portable electronic devices have encouraged the utilization and further advancement of energy storage components such as supercapacitors or batteries [1–4]. To make existing or upcoming upgraded electronics slimmer, lighter, and more flexible, enhanced energy supply systems are necessarily required. Enhanced electronic devices or technologies which have exhibited great scope of application include electronic textiles, flexible displays, distributed sensors, artificial electronic skin, etc. [5–7]. However, researchers continue to search for promising energy storage systems to achieve desired features for more complex electronic devices [8–10]. Supercapacitors have potential for energy storage utilization in future electronics devices, owing to characteristics including

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In silico prediction of natural compounds as potential multi-target inhibitors of structural proteins of SARS-CoV-2

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ABSTRACT

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has caused a colossal loss to human health and lives and has deeply impacted socio-economic growth. Remarkable efforts have been made by the scientific community in containing the virus by successful development of vaccines and diagnostic kits. Initiatives towards drug repurposing and discovery have also been undertaken. In this study, we compiled the known natural anti-viral compounds using text mining of the literature and examined them against four major structural proteins of SARS-CoV-2, namely, spike (S) protein, nucleocapsid (N) protein, membrane (M) protein and envelope (E) protein. Following computational approaches, we identified fangchinoline and versicolactone C as the compounds to exhibit strong binding to the target proteins and causing structural deformation of three structural proteins (N, S and M). We recommend the inhibitory effects of these compounds from our study should be experimentally validated against SARS-CoV-2.

ARTICLE HISTORY
Received 27 March 2021
Accepted 10 August 2021

KEYWORDS
SARS-CoV-2; natural antiviral compounds; docking; simulation; COVID-19

Introduction

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) from the Coronaviridae family has created an unprecedented healthcare crisis (Khan et al., 2020). It has disseminated around the world with a mortality rate of 2.15% (22 July, 2021) (WHO). Further, the emergence of new variants of SARS-CoV2 and their high transmission rate has created an unparalleled disruption in human life and still poses a big threat to human health and global economy. In the past decades, several epidemics have been caused by coronavirus, which include SARS-CoV in 2003 with a mortality rate of 10% (Cheng et al., 2007; Lee et al., 2003) and Middle East Respiratory Syndrome (MERS) in 2012 with 35% mortality rate (de Groot et al. 2013; Zaki et al., 2012). The pathogenicity of SARS-CoV-2 is relatively less than SARS-CoV and MERS, but it is infectivity is higher than other harmless human coronaviruses (Dömling & Gao, 2020). The recent launch of several vaccines has opened the possibility of containing the infection and providing protection to a large populace. However, effective drugs for the treatment of infections caused by coronaviruses (Wu et al., 2020) are still not available and a hunt for drugs against SARS-CoV2 remains critical for the therapeutic interventions.

For discovery of new drugs, natural compounds serve as rich resources (Lin et al., 2014) and nearly a quarter of approved drugs have plant origins (Thomford et al., 2018). Several well-characterized natural compounds have been documented for their antimicrobial, anti-inflammatory and other beneficial effects on humans and animals thereby offering promising sources for drug development (Clark, 1996; El Sayed, 2000). Advancement in the synthetic biology also has accelerated the mass production of natural compounds (Chen et al., 2021). The ethno-medical literature has listed various herbal plants for their appealing antiviral activity (Ganjhu et al., 2015; Mukhtar et al., 2008; Potroz & Cho, 2015). Natural products include extracts from herbal plants, phytoconstituents, and precise extracts of seed, root, fruit, stem, and flower of plants (Boukhatem & Setzer, 2020; Rates, 2001). Several derivatives of medicinal herbs have been widely considered for antiviral activity (Ganjhu et al., 2015). Antiherpetic acyclovir', amoebicide 'emetine' and antimalarial quinine are good examples of drugs modeled on natural products (El Sayed, 2000; Ganjhu et al., 2015). Some of the medicinal plants have also shown antiviral activity against SARS-CoV-2 (Benarba & Pandiella, 2020; Mesli et al., 2021; Mouffouk et al., 2021).

SARS-CoV-2 genome contains approximately 30,000 bases but encodes only a few proteins (Dömling & Gao, 2020). The structural proteins, namely, spike protein, envelope protein, membrane protein and nucleocapsid protein are essential to complete the viral structure. Spike (S) protein mediates the entry of virus into host cells (Wrapp et al., 2020); membrane

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In silico prediction of natural compounds as potential multi-target inhibitors of structural proteins of SARS-CoV-2

Jyoti Rani[a,b], Anasuya Bhargav[b,c], Faez Iqbal Khan[d], Srinivasan Ramachandran[b,c], Dakun Lai[d] and Urmi Bajpai[a]

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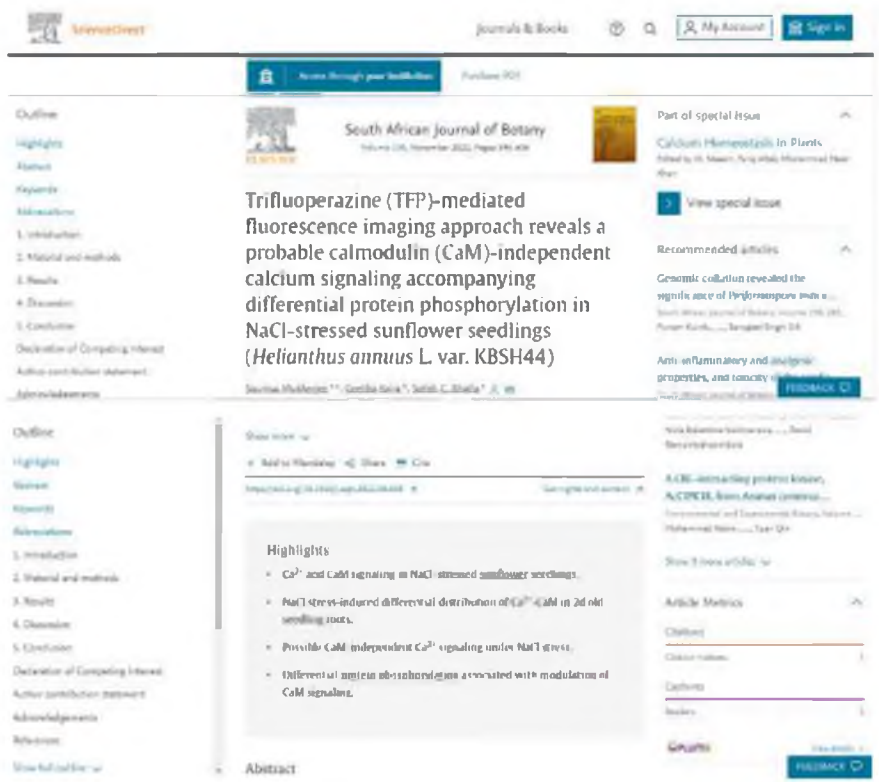
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Trifluoperazine (TFP)-mediated fluorescence imaging approach reveals a probable calmodulin (CaM)-independent calcium signaling accompanying differential protein phosphorylation in NaCl-stressed sunflower seedlings (Helianthus annuus L. var. KBSH44)
Highlights
Abstract

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Breeding System and Response of the Pollinator to Floral Larceny and Florivory Define the Reproductive Success in *Aerides odorata*

*Arjun Adit[1], Vineet Kumar Singh[2], Monika Koul[3] and Rajesh Tandon[1]**

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Consumption of pollination reward by felonious means in a plant species can influence the foraging behavior of its pollinator and eventually the reproductive success. So far, studies on this aspect are largely confined to interaction involving plant-pollinators and nectar robbers or thieves. However, a foraging guild in such interactions may also include floral herbivores or florivores. There is a paucity of information on the extent to which nectar larcenists may influence the foraging behavior of the pollinator and reproductive fitness of plants in the presence of a florivore. We investigated various forms of larceny in the natural populations of *Aerides odorata*, a pollinator-dependent and nectar-rewarding orchid. These populations differed in types of foraging guild, the extent of larceny (thieving/robbing), which can occur with or without florivory, and natural fruit-set pattern. The nectariferous spur of the flower serves as an organ of interest among the foraging insects. While florivory marked by excision of nectary dissuades the pollinator, nectar thieving and robbing significantly enhance visits of the pollinator and fruit-set. Experimental pollinations showed that the species is a preferential outbreeder and experiences inbreeding depression from selfing. Reproductive fitness of the orchid species varies significantly with the extent of floral larceny. Although nectar thieving or robbing is beneficial in this self-compatible species, the negative effects of florivory were stronger. Our findings suggest that net reproductive fitness in the affected plant species is determined by the overarching effect of its breeding system on the overall interacting framework of the foraging guild.

Keywords: floral herbivory, foraging guilds, orchids, nectar robbing, mixed-mating

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INTRODUCTION

Floral nectar, the major pollination reward among the flowering plants, is presented to the pollinators in two ways - openly or selectively. The selective mode is associated with flowers in which nectar is concealed. The hidden floral reward can be consumed by a suitable pollinator only when it is legitimately accessed (Fenster, 1991). The dynamics of production and presentation of nectar by a plant play a crucial role in maintaining constancy with suitable pollinators and sustaining fruit-set (fitness). Altered foraging behavior of the pollinator can adversely influence the fitness when there is discontinuous provisioning of rewards. A variety of foragers who illegitimately

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TERM

REVIEW ARTICLE

An Insight of Nanomaterials in Tissue Engineering from Fabrication to Applications

Ritika Sharma[1] · Sanjeev Kumar[2,3] · Bhawna[2,3] · Akanksha Gupta[4] · Neelu Dheer[5] · Pallavi Jain[6] · Prashant Singh[7] · Vinod Kumar[2,8]

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Tissue engineering is a research domain that deals with the growth of various kinds of tissues with the help of synthetic composites. With the culmination of nanotechnology and bioengineering, tissue engineering has emerged as an exciting domain. Recent literature describes its various applications in biomedical and biological sciences, such as facilitating the growth of tissue and organs, gene delivery, biosensor-based detection, etc. It deals with the development of biomimetics to repair, restore, maintain and amplify or strengthen several biological functions at the level of tissue and organs. Herein, the synthesis of nanocomposites based on polymers, along with their classification as conductive hydrogels and bioscaffolds, is comprehensively discussed. Furthermore, their implementation in numerous tissue engineering and regenerative medicine applications is also described. The limitations of tissue engineering are also discussed here. The present review highlights and summarizes the latest progress in the tissue engineering domain directed at functionalized nanomaterials.

Keywords Tissue engineering · Nanomaterials · Nanotechnology · Regenerative medicine · Biomimetics · Conductive hydrogels · Polymers · Scaffolds

1 Introduction

In tissue engineering (TE) domain, tissue growth is initiated by 3D-scaffolds; the cells proliferate and differentiate into several types or from a base of cells. These scaffolds are combined with growth factors (GFs) to direct cell behaviour and enable the production of tissue. These engineered tissues are functional and capable of implant growth and regeneration [1–5]. Currently, it has become an impressive tool for repairing and reconstructing impaired organs and tissues. In the past two decades, the immense implementation of nanomaterials (NMs) in TE has progressed tremendously (Fig. 1).

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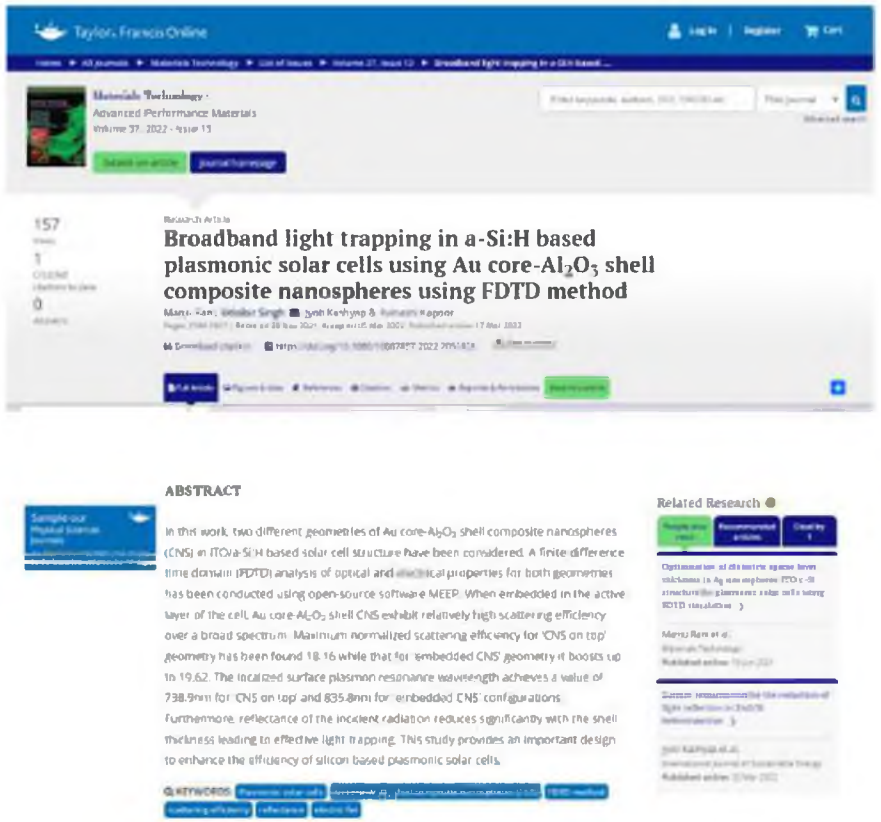

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Advanced Performance Materials

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Research Article

Broadband light trapping in a-Si:H based plasmonic solar cells using Au core-Al_2O_3 shell composite nanospheres using FDTD method

ABSTRACT

In this work, two different geometries of Au core-Al_2O_3 shell composite nanospheres (CNS) in ITO/a-Si:H based solar cell structure have been considered. A finite-difference time domain (FDTD) analysis of optical and electrical properties for both geometries has been conducted using open-source software MEEP. When embedded in the active layer of the cell, Au core-Al_2O_3 shell CNS exhibit relatively high scattering efficiency over a broad spectrum. Maximum normalized scattering efficiency for 'CNS on top' geometry has been found 18.16 while that for 'embedded CNS' geometry it boosts up to 19.62. The localized surface plasmon resonance wavelength achieves a value of 738.9nm for 'CNS on top' and 835.8nm for 'embedded CNS' configurations. Furthermore, reflectance of the incident radiation reduces significantly with the shell thickness leading to effective light trapping. This study provides an important design to enhance the efficiency of silicon based plasmonic solar cells.

KEYWORDS

Related Research

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A Novel Framework for Assessing the Criticality of Retrieved Information

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Abstract: Data created by microblogging platforms provide an exceptional opportunity to mine valuable insights; however, their application in critical information retrieval is still at its inflection point. Taking advantage of Deep Learning (DL) and Natural Language Processing (NLP) techniques, this paper proposes a novel framework for retrieving critical information from Twitter to manage emergencies effectively. The proposed framework classifies the tweets into relevant and irrelevant classes using Bidirectional Encoder Representations from Transformers (BERT). Subsequently, relevant tweets are clustered using a k-means algorithm based on textual semantic similarity obtained using Universal Sentence Encoder (USE). Finally, the critical value of tweets is computed to segregate the relevant information that may assist the management teams to plan and organize their operations efficiently. The proposed work was tested on a real-world dataset of Uttarakhand Floods that occurred in February 2021. The critical information retrieved may be deployed to quickly manage disastrous situations and take the appropriate measures in time.

Keywords: Text Classification, BERT, k-means, Semantic Similarity, Clustering, Information Retrieval, Critical information.

1. Introduction

The advent of social media has marked a shift in information collection and dissemination during emergencies [1]. Researchers have leveraged social media to conduct numerous studies, including but not limited to outbreak detection [2], [3], information retrieval [4], evacuation behavior [5], [6], hazard assessment [6], and damage assessment [7], [8]. Twitter is one of the microblogging platforms that facilitate researchers in carrying out their studies on real-world data. It has 316 million users [9], empowering it with the capability of real-time feedback. Therefore, the potential of Twitter as a dependable and relevant data source is evident [10], [11]. It provides a platform for sharing crucial information and opinions on news updates, government and non-government initiatives and policies, and even requesting assistance during critical times [3], [12], [13]. Many studies [14], [15], [16], [17], [18] have proved that social media platforms like Twitter have also been beneficial to spread situational awareness during an emergency. Situational awareness may be defined as the available knowledge to assess and cope with a situation [18]. Thus, it plays an essential role in helping people during an emergency.

During critical times, government and non-government organizations look for related information to mitigate the adverse impact of the tragedies. Public authorities rely on timely and vital information to launch their operations timely for rescue management. The concerned authorities may send out alerts and learn the urgent needs of affected people to allocate the resources and take appropriate actions [8], [19]. Although social media platforms are promising data resources for emergencies, identifying helpful information for decision-making and action-taking is still challenging [20].

The vast volume of data on social media may contain an enormous amount of unwanted information, which can be overwhelming and bewildering to anyone trying to retrieve crucial details [21], [22]. Thus, it is essential to filter out the irrelevant information and segregate the relevant information to ensure that the precise information reaches the concerned authorities in time. Further, it may reduce the response time for relief and recovery measures during the emergency and increase situational awareness. As natural disasters are occurring more frequently than ever before, a system that could collect the data quickly during the crisis and facilitate assessing the severity of the situation

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Multiple ionisation and Coulomb explosion in terawatt photoexcitation of Xenon clusters: An experimental and theoretical study

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Abstract

Multiple ionisation and Coulomb explosion following photoexcitation of xenon clusters has been studied at ~ 10^{12} W/cm^2 at three different wavelengths in UV and visible region. Multiply charged xenon ions (Xe^{q+}) up to +4, +6 and +10 states were observed in time of flight mass spectra at 266, 355 and 532 nm respectively. Energetic electrons were also detected and electron energy distribution was measured at all the three wavelengths. The maximum electron energy was found to be dependent on the ionising wavelength. It has been established that multiphoton ionisation creates Xe^+ ions and the energetic electrons cause secondary ionization of singly charged xenon ion (Xe^+) to give rise to higher charged states of xenon. An analytical model has been developed to understand the multiple ionization of xenon clusters at terawatt laser intensity. It reveals that lowering of ionization potential and excitation to Rydberg states of ions are important factors to generate high charge states like Xe^{10+}, consistent are with the experimental results.

FEEDBACK

INTERNATIONAL JOURNAL OF SYSTEMATIC AND EVOLUTIONARY MICROBIOLOGY

Volume 71, Issue 2

Short Communication

Genome-based reclassification of *Amycolatopsis eurytherma* as a later heterotypic synonym of *Amycolatopsis thermoflava*

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frontiers in Chemistry

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REVIEW
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Endophytic Nanotechnology: An Approach to Study Scope and Potential Applications

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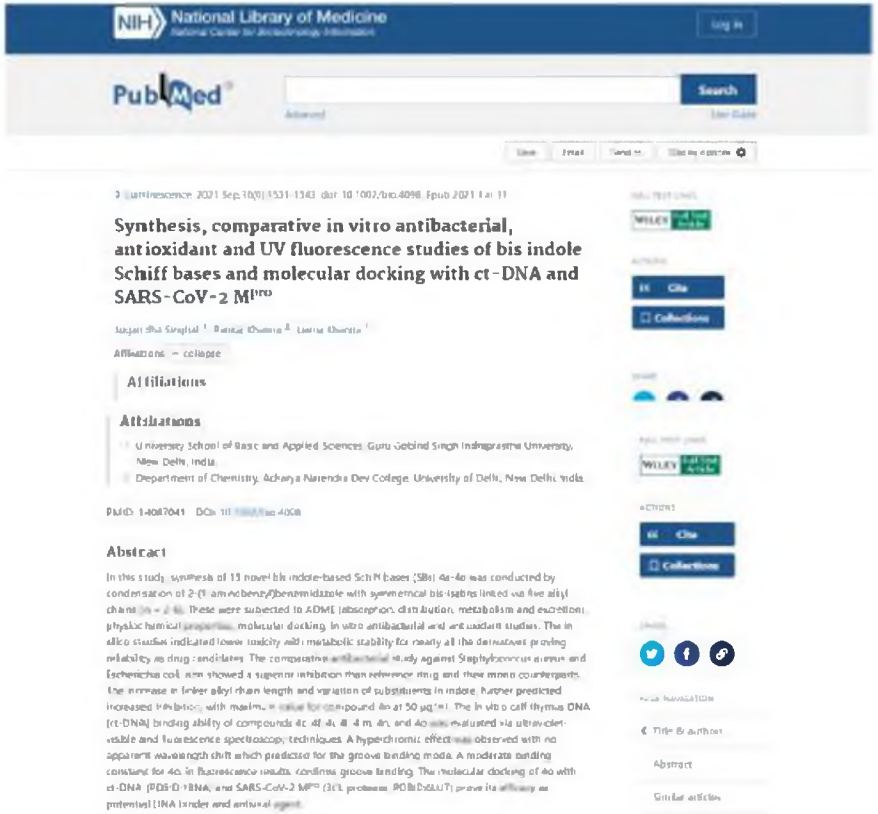
Nanotechnology has become a very advanced and popular form of technology with huge potentials. Nanotechnology has been very well explored in the fields of electronics, automobiles, construction, medicine, and cosmetics, but the exploration of nanotechnology's use in agriculture is still limited. Due to climate change, each year around 40% of crops face abiotic and biotic stress; with the global demand for food increasing, nanotechnology is seen as the best method to mitigate challenges in disease management in crops by reducing the use of chemical inputs such as herbicides, pesticides, and fungicides. The use of these toxic chemicals is potentially harmful to humans and the environment. Therefore, using NPs as fungicides/ bacteriocides or as nanofertilizers, due to their small size and high surface area with high reactivity, reduces the problems in plant disease management. There are several methods that have been used to synthesize NPs, such as physical and chemical methods. Specially, we need ecofriendly and nontoxic methods for the synthesis of NPs. Some biological organisms like plants, algae, yeast, bacteria, actinomycetes, and fungi have emerged as superlative candidates for the biological synthesis of NPs (also considered as green synthesis). Among these biological methods, endophytic microorganisms have been widely used to synthesize NPs with low metallic ions, which opens a new possibility on the edge of biological nanotechnology. In this review, we will have discussed the different methods of synthesis of NPs, such as top-down, bottom-up, and green synthesis (specially including endophytic microorganisms) methods, their mechanisms, different forms of NPs, such as magnesium oxide nanoparticles (MgO-NPs), copper nanoparticles (Cu-NPs), chitosan nanoparticles (CS-NPs), β-d-glucan nanoparticles (GNPs), and engineered nanoparticles (quantum dots, metalloids, nonmetals, carbon nanomaterials, dendrimers, and liposomes), and their molecular approaches in various aspects. At the molecular level, nanoparticles, such as mesoporous silica nanoparticles (MSN) and RNA-interference molecules, can also be used as molecular tools to carry genetic material during genetic engineering of plants. In plant disease management, NPs can be used as biosensors to diagnose the disease.

Keywords: nanotechnology, nanoparticles, crop yield, genetic engineering, molecular approaches, gene carriers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Coronaviruses, 2021, 2, e300421188050

REVIEW ARTICLE

BENTHAM SCIENCE

Structure, Transmission, Diagnostic Symptoms, Host and Entry Mechanism of COVID-19: A Review

Prashant Swapnil[1], Mukesh Meena[2,*], Tansukh Barupal[3], Yashwant Sompura[3] and Deepa Hada[3]

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Abstract: In Wuhan, China, a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been reported and caused coronavirus disease 19 (COVID-19). The coronavirus infection is pathogenic and highly transmittable and spread quickly around the world by the human to human contact. Through genomic analysis, it has been revealed that the primary reservoir of SARS-CoV-2 is bats due to having severe acute respiratory syndrome-like (SARS-like) viruses phylogenetically. The viral infection is rapidly transmitted by the human to human contact, but the intermediate source of their origin and transfer is not known. To date, any clinically approved vaccine or antiviral drug has not been prepared against COVID-19. However, researchers and scientists have evaluated some broad-spectrum antiviral drugs against COVID-19 through clinical trials and they have found satisfactory clinical recovery. This review summarizes the comparative analysis of the emergence and pathogenicity of COVID-19, severe acute respiratory syndrome coronavirus (SARS-CoV), and Middle East respiratory syndrome coronavirus (MERS-CoV). This review is also focused on the development of effective vaccines or antidrug and also provides details related to an approach to practice therapeutic combinations to fight against this viral outbreak.

Keywords: COVID-19, SARS-CoV-2, glycoprotein, infection, symptoms, prevention.

1. INTRODUCTION

The term corona has been raised from the crown-like appearance (Corona is a Latin word it means crown-like). Nucleic acid material of coronavirus constituted with single-stranded RNA. The virus is also known as severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), and the family of coronavirus is divided into different classes such as alpha (α), beta (β), gamma (γ), and delta (δ). The β class of coronavirus was reported as the main cause of COVID-19. This disease has been declared as a pandemic and zoonotic disease due to quick transmission in animals and humans. Previously, it is known that this virus is only transmitted in animals until the world witnessed in humans. In Guangdong, China 2003, SARS-CoV has been identified as the outbreak of SARS-CoV-1 [1]. In Middle Eastern countries, an endemic was announced due to another pathogenic coronavirus, called the Middle East respiratory syndrome (MERS-CoV), only a decade later [2]. Recently, Wuhan emerged as the business hub of china at the end of 2019. An outbreak of a novel coronavirus reported more than 177000 deaths and over sixteen lakhs of infections. Previously, SARS-CoV-2 has been named as the Wuhan coronavirus or 2019 novel coronavirus (2019-NCOV) in China, which further finally named as SARS-CoV-2 by the International Committee on Taxonomy of Viruses (ICTV) and this disease called COVID-19 [3-5]. In 2003, SARS-CoV infected around 8098 individuals with 9% mortality rate across 26 countries globally, while novel coronavirus 2019 caused infection and death around 4098018 and 283271 in individuals with a 2.9% mortality rate across 215 countries.

2. NOMENCLATURE

According to the World Health Organisation (WHO), U.S. Centers for Disease Control and Prevention (CDC), and ICTV, COVID-19 stands for CO-corona, VI-virus, D-disease, 19-2019 while SARS-CoV-2 for severe acute respiratory syndrome coronavirus-2 [6].

3. CLASSIFICATION

According to ICTV [1, 7], the classification of coronavirus is given below.

Category	Coronaviruses
Realm	*Riboviria*

contd....

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Computational identification and characterization of antigenic properties of Rv3899c of *Mycobacterium tuberculosis* and its interaction with Human leukocyte antigen (HLA)

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Computational identification and characterization of antigenic properties of Rv3899c of *Mycobacterium tuberculosis* and its interaction with Human leukocyte antigen (HLA)

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REVIEW ARTICLE

Taxonomically Characterized and Validated Bacterial Species Based on 16S rRNA Gene Sequences from India During the Last Decade

Princy Hira[1] · Priya Singh[2] · Anil Kumar Pinnaka[3] · Suresh Korpole[3] · Rup Lal[4]

Received: 19 July 2019 / Accepted: 27 November 2019 / Published online: 3 December 2019

Abstract Microbial taxonomy dealing with identification and characterization of prokaryotes like bacteria and archaea has always been a major area of research all over the world. Exploring diversity of microbes and description of novel species with different genes and secondary compounds is of utmost importance for better future and sustenance of life. India having an enormous range of ecosystems and diverse species inhabiting these niches is considered to be one of the richest biodiversity regions of the world. During the last decade, with newer methodologies and better technology, the prokaryotic taxonomy from India has extended our inventory of microbial communities in specific niches. However, there still exist some limitations in classifying the microbes from India as compared to that is done world-over. This review enlists the taxonomic description of novel taxa of prokaryotes from India in the past decade. A total of 378 new bacterial species have been classified from different habitats in India in the last ten years and no descriptions of archaeal species is documented till date.

Keywords Microbial taxonomy · Classification · Niches · Novel species · Indian biodiversity

Princy Hira and Priya Singh have contributed equally to this work.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12088-019-00845-7) contains supplementary material, which is available to authorized users.

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Introduction

Among one of the richest biodiversity regions of the world, India encompasses from greater Himalayas in the north to the second largest peninsula in the south that show diverse environmental conditions across it and contain three unique biodiversity hotspots viz., Western Ghats, eastern Himalayas and the Indo-Burma region. Also, it has desert in west, world's largest alluvial plain (Great plain of north India) and the thick forests in east. This results into richness of the diversity of both flora and fauna with respect to various environmental conditions. While the wealth of this diversity with respect to higher forms of life, viz., plants and animals is well explored and inventoried, such efforts in prokaryote diversity are recent that need lot more to be discovered and classified. The field of microbial taxonomy in India has taken a new dimension in the last decade and exponentially added the descriptions of new taxa of prokaryotes in the catalogue using polyphasic approach. Along with the description of novel species, the identification of new genes important for environment and human health has various industrial and biotechnological applications [1]. Therefore, taxonomical classification of commercially important organisms acts as a base for further studies on microbiological research. While there are quite a few research groups carrying out microbial taxonomy in India, but with the new and improved methodologies in the recent years' microbiologists have managed to unravel the

ORIGINAL RESEARCH ARTICLE

Prediction of Transcription Factors and Their Involvement in Regulating Rifamycin Production in *Amycolatopsis mediterranei* S699

Nirjara Singhvi[1] · Vipin Gupta[1] · Priya Singh[1,2] · Om Prakash[3] · Andreas Bechthold[4] · Yogendra Singh[1] · Rup Lal[5]

Received: 17 February 2020 / Accepted: 3 April 2020 / Published online: 18 April 2020

Abstract *Amycolatopsis mediterranei* S699 produces rifamycin B and successors of this strain are in use for the industrial production of rifamycin B. Semisynthetic derivatives of rifamycin B are used against *Mycobacterium tuberculosis* that causes tuberculosis. Although the rifamycin biosynthetic gene cluster was characterized two decades ago, the regulation of rifamycin B biosynthesis in *Amycolatopsis mediterranei* S699 is poorly understood. In this study, we analysed the genome and proteome of *Amycolatopsis mediterranei* S699 and identified 1102 transcription factors which comprise about 10% of the total genome. Using interactomics approaches we delineated 30 unique transcription factors directly involved in secondary metabolism that regulate rifamycin B biosynthesis. We also predict the role of RifN as hub in controlling the regulation of other genes involved in rifamycin biosynthesis. RifN is important for maintaining the integrity of the rifamycin-network. Thus, these transcription factor can be exploited to improve rifamycin B production in *Amycolatopsis mediterranei* S699.

Keywords Transcription factors · *Amycolatopsis mediterranei* · Rifamycin · Regulation · Interactomics

Nirjara Singhvi and Vipin Gupta have contributed equally.

Electronic supplementary material The online version of this article (https://doi.org/10.1007/s12088-020-00868-5) contains supplementary material, which is available to authorized users.

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Introduction

In prokaryotic cells, transcription factors (TF) are proteins that play important role in controlling the rate of transcription of a gene. TF's bind to specific DNA sequences enabling RNA-polymerases to perform the transcription process. There are a wide range of transcription factors. Some harbour DNA binding regions that bind directly to promotors. Others bind to the enhancer region of a gene. Proteins binding directly to the promoter region initiates the transcription process. TFs binding to the enhancer regions are indirectly stimulating or repressing the transcription process [1]. It is known that regulation of transcription factor is the most important form to control a gene expression. TF have been identified in bacterial family actinobacteria like genus *Streptomyces* have been reported to control gene expression and their regulation within the organized network [1, 2].

Amycolatopsis mediterranei S699 is a well-known actinobacterium that produces rifamycin B. It has been developed as industrial strains for the production of rifamycin B primarily by using classical strain improvement methods [3]. Semisynthetic derivatives of rifamycin B are

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PGPR-mediated induction of systemic resistance and physiochemical alterations in plants against the pathogens: Current perspectives

Mukesh Meena [1,3], Prashant Swapnil [2,3], Kumari Divyanshu [1], Sunil Kumar [2], Harish [4], Yashoda Nandan Tripathi [3], Andleeb Zehra [3], Avinash Marwal [1], Ram Sanmukh Upadhyay [2]

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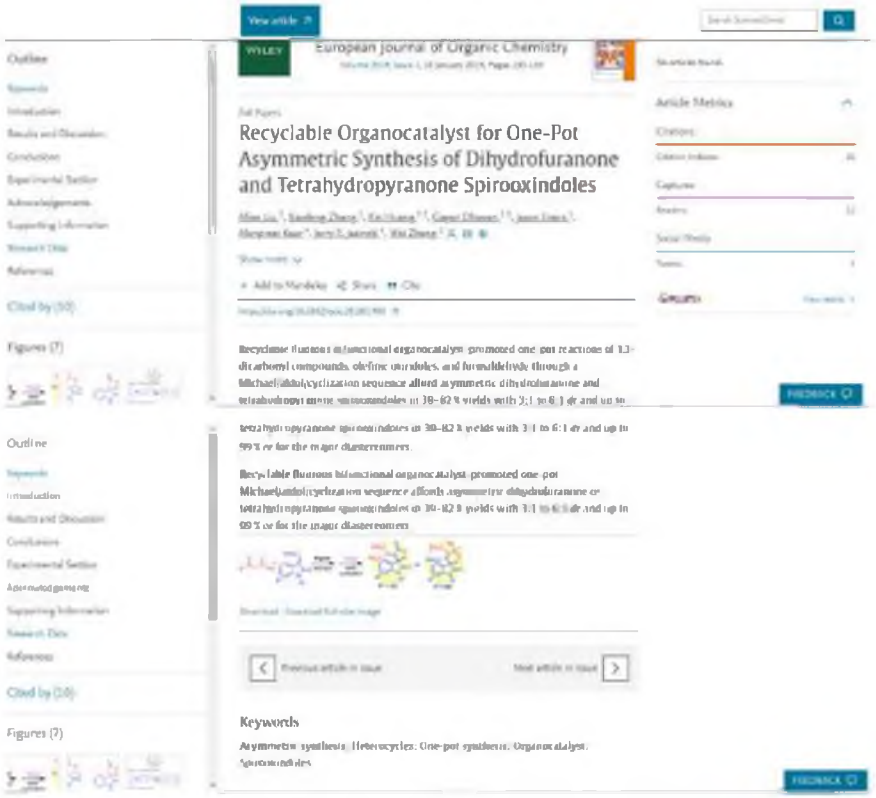
PMID: 32815221 DOI: 10.1002/jobm.202000370

Abstract

Plant growth-promoting rhizobacteria (PGPR) are diverse groups of plant-associated microorganisms, which can reduce the severity or incidence of disease during antagonism among bacteria and soil-borne pathogens, as well as by influencing a systemic resistance to elicit defense response in host plants. An amalgamation of various strains of PGPR has improved the efficacy by enhancing the systemic resistance opposed to various pathogens affecting the crop. Many PGPR used with seed treatment causes structural improvement of the cell wall and physiological/biochemical changes leading to the synthesis of proteins, peptides, and chemicals occupied in plant defense mechanisms. The major determinants of PGPR-mediated induced systemic resistance (ISR) are lipopolysaccharides, lipopeptides, siderophores, pyocyanin, antibiotics 2,4-diacetylphoroglucinol, the volatile 2,3-butanediol, N-alkylated benzylamine, and iron-regulated compounds. Many PGPR inoculants have been commercialized and these inoculants consequently aid in the improvement of crop growth yield and provide effective reinforcement to the crop from disease, whereas other inoculants are used as biofertilizers for native as well as crops growing at diverse extreme habitat and exhibit multifunctional plant growth-promoting attributes. A number of applications of PGPR formulation are needed to maintain the resistance levels in crop plants. Several microarray-based studies have been done to identify the genes, which are associated with PGPR-induced systemic resistance. Identification of these genes associated with ISR-mediating disease suppression and biochemical changes in the crop plant is one of the essential steps in understanding the disease resistance mechanisms in crops.


European Journal of Organic Chemistry
Recyclable Organocatalyst for One-Pot Asymmetric Synthesis of Dihydrofuranone and Tetrahydropyranone Spirooxindoles
Keywords

A modified intuitionistic fuzzy c-means clustering approach to segment human brain MRI image

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School of Computer & System Sciences[1,2,4]
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Department of Mathematics[3]
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Abstract

Fuzzy c means (FCM) is one of the prominent method utilized for medical image segmentation. The research work [1] suggested intuitionistic fuzzy c-means to handle uncertainty and vagueness associated with real data. The author defined an objective function which incorporated the hesitation degree along with membership degree. However, instead of solving the objective function analytically, the approximate solution is obtained. In this paper, we have proposed a modified intuitionistic fuzzy c-means algorithm (MIFCM) and solved analytically the objective function of modified intuitionistic fuzzy c means algorithm (MIFCM) using Lagrange method of undetermined multiplier. To incorporate hesitation degree, two parametric intuitionistic fuzzy complements namely Sugeno's negation function and Yager's negation function are investigated. The performance of the proposed MIFCM method is compared with three intuitionistic fuzzy clustering methods and the FCM on two publically available MRI dataset and a synthetic dataset. The performance measures (average segmentation accuracy, dice score, jaccard score, false negative ratio and false positive ratio) are used to compare the performance of the proposed method with three variants of intuitionistic fuzzy clustering methods and the FCM. Experimental results demonstrate the superior performance of the proposed method over others.

1 Introduction

Image segmentation is one of the important phase in image analysis and pattern recognition because of its wide real life applications such as medical image analysis, computer vision, industrial inspections etc.. In last few years, medical image analysis is used for diagnosis of various disease such as Parkinson, Alzheimer, Schizophrenia etc.. For this, many medical imaging modalities, such as Computed

Advances in Natural Sciences: Nanoscience and Nanotechnology

PAPER

Performance of chitosan derived activated carbon in supercapacitor

Sultan Ahmed[1,2], Ahsan Ahmed[3] and M Rafat[1]

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Abstract

Abstract

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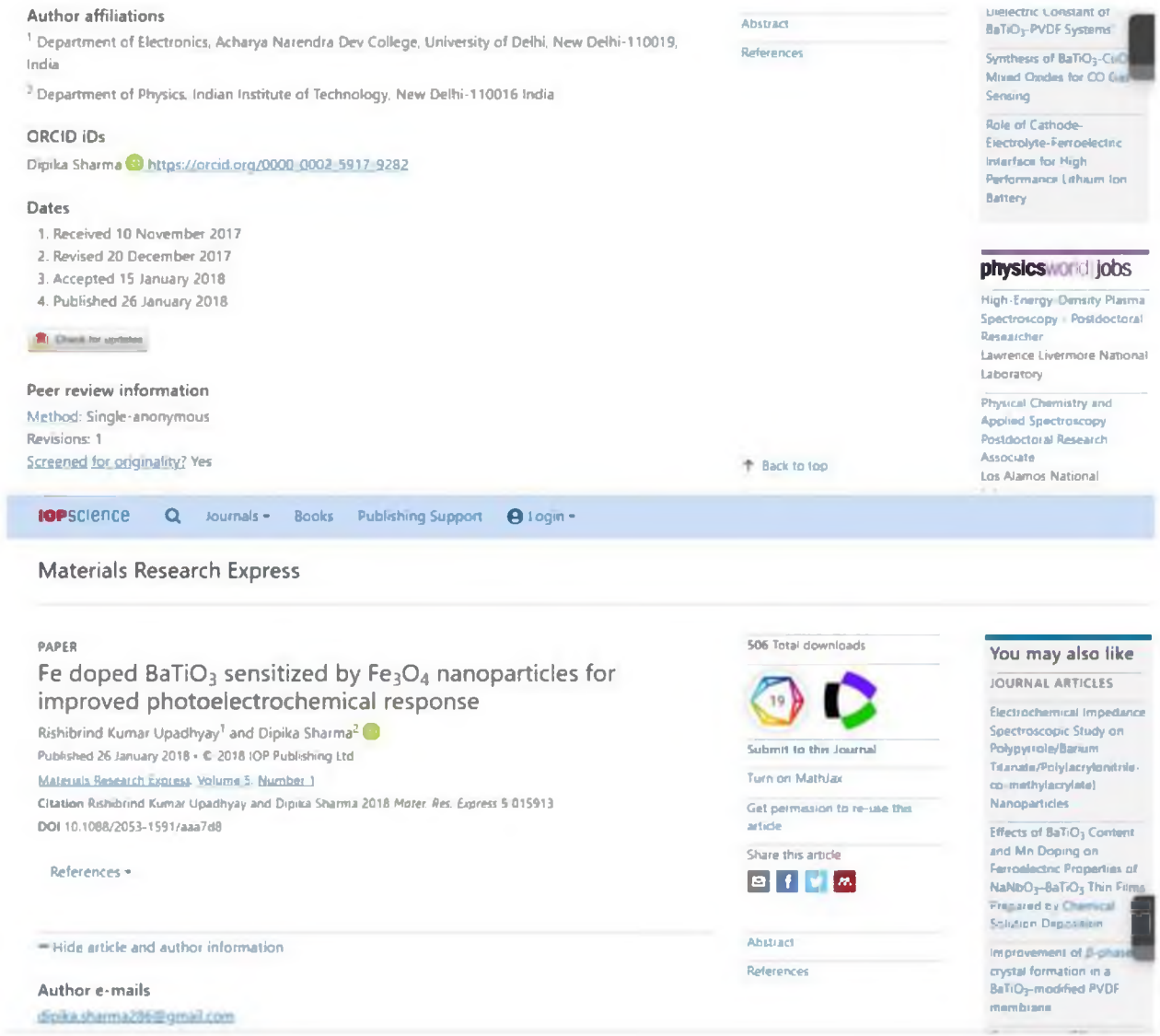

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PAPER

Fe doped $BaTiO_3$ sensitized by Fe_3O_4 nanoparticles for improved photoelectrochemical response

Rishibrind Kumar Upadhyay[1] and Dipika Sharma[2]

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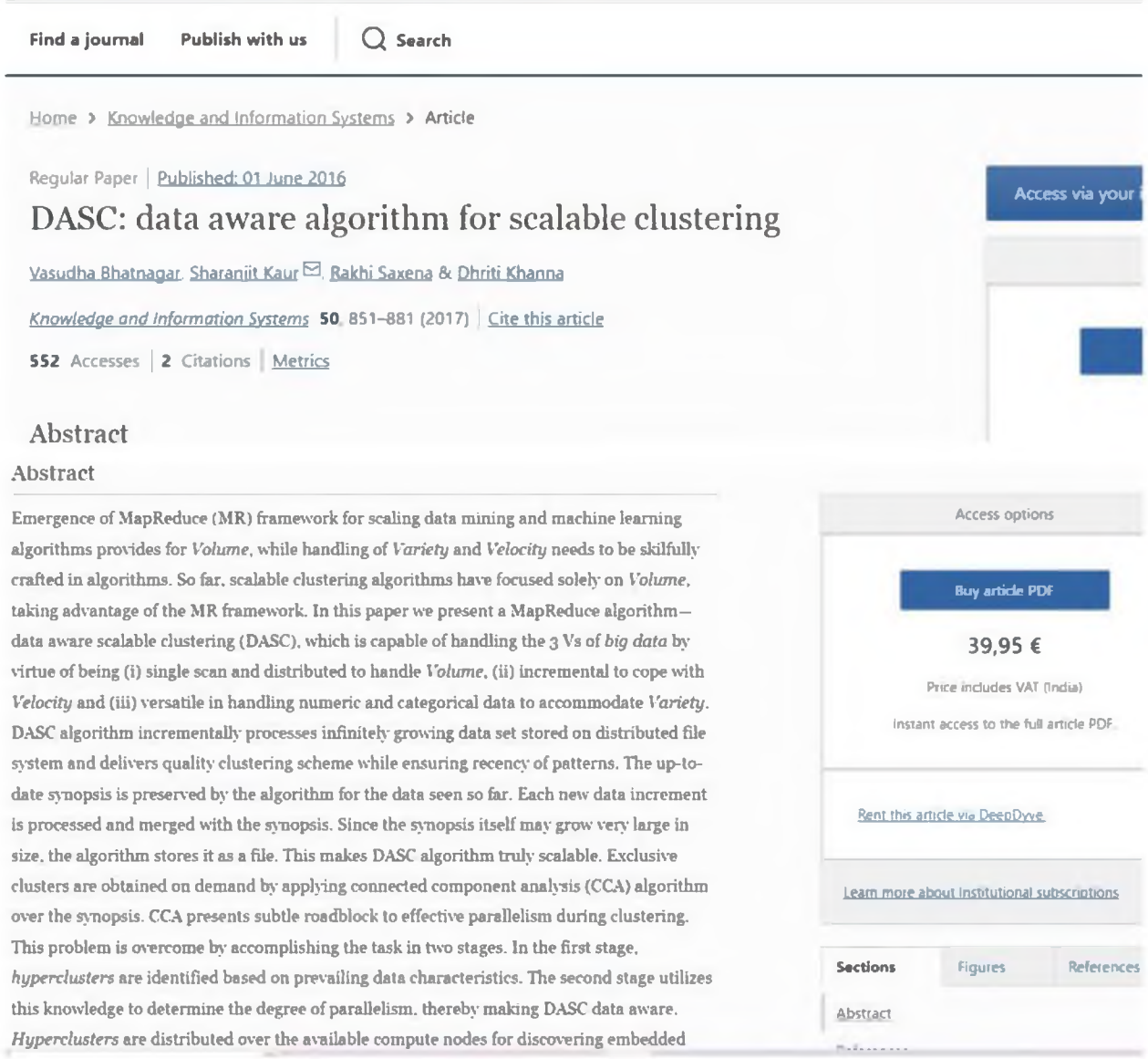

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DASC: data aware algorithm for scalable clustering

Vasudha Bhatnagar, Sharanjit Kaur, Rakhi Saxena & Dhriti Khanna

Knowledge and Information Systems 50, 851–881 (2017) | Cite this article

Abstract

Abstract

Emergence of MapReduce (MR) framework for scaling data mining and machine learning algorithms provides for *Volume*, while handling of *Variety* and *Velocity* needs to be skilfully crafted in algorithms. So far, scalable clustering algorithms have focused solely on *Volume*, taking advantage of the MR framework. In this paper we present a MapReduce algorithm—data aware scalable clustering (DASC), which is capable of handling the 3 Vs of *big data* by virtue of being (i) single scan and distributed to handle *Volume*, (ii) incremental to cope with *Velocity* and (iii) versatile in handling numeric and categorical data to accommodate *Variety*. DASC algorithm incrementally processes infinitely growing data set stored on distributed file system and delivers quality clustering scheme while ensuring recency of patterns. The up-to-date synopsis is preserved by the algorithm for the data seen so far. Each new data increment is processed and merged with the synopsis. Since the synopsis itself may grow very large in size, the algorithm stores it as a file. This makes DASC algorithm truly scalable. Exclusive clusters are obtained on demand by applying connected component analysis (CCA) algorithm over the synopsis. CCA presents subtle roadblock to effective parallelism during clustering. This problem is overcome by accomplishing the task in two stages. In the first stage, *hyperclusters* are identified based on prevailing data characteristics. The second stage utilizes this knowledge to determine the degree of parallelism, thereby making DASC data aware. *Hyperclusters* are distributed over the available compute nodes for discovering embedded

SCIENTIFIC CORRESPONDENCE

Bioacoustics or pitfall traps: comparison of a modern and traditional method to estimate Ensifera richness

The order Orthoptera occurs in a variety of terrestrial ecosystems and serves as an important primary consumer and prey base for bats[1], birds and spiders[2]. Orthopteran communities are affected by vegetation structure and composition and respond strongly to changes in plant [illegible]. Hence, they are suitable for monitoring and conservation studies[3,4]. A variety of sampling methods such as sweep netting, pitfall traps and malaise traps or light traps are employed for estimation of Orthoptera diversity and their abundance from a localized or over a large area[5,6]. Studies on transect counts, quadrat sampling and sweep netting have been carried out mainly in grasshoppers and in a few cases in katydids and field crickets for comparing efficiency of [illegible] in estimating orthopteran diversity patterns[7,8]. One of the most commonly employed techniques for collecting surface-active invertebrates is pitfall trapping[9]. However, pitfall traps for Orthoptera species [illegible] due to changes in [illegible][10]. Species-specific calls of ensiferan insects serve as a reliable method for species identification as each species has a unique frequency and temporal pattern. Bioacoustics monitoring is widely used for Orthoptera species richness estimation[11,12]. Though studies on effectiveness of acoustic methods with respect to traditional methods have been carried out in birds and mammals, studies are lacking in [illegible] groups[13–15]. Also, distribution and [illegible] pattern of Orthoptera at an urban ecosystem level has received little attention in India and worldwide[16,17].

The aim of the present study is to (1) estimate species richness of Ensifera (Insaurder: Grylloidea) in Delhi and suburban region using bioacoustics method; (2) Compare the bioacoustics method and pitfall trapping in estimating species richness of Ensifera (Infraorder: Grylloidea), and (3) quantify diversity of other invertebrates captured in the pitfall traps.

The acoustic sampling of ensiferans was carried out at four locations in Delhi region (28.613°N, 77.209°E). Site one (S1) was a [illegible] grassland area, site two (S2) was an urban residential area, site three (S3) had [illegible] vegetation characteristics of an arid region with *Prosopis* sp. and *Acacia* sp. as dominant tree species and site four (S4) had [illegible] landscaped gardens with [illegible] managed by civic authorities. The acoustic and pitfall sampling were carried out from January to April during 2013 and 2014 respectively. The temperatures ranged from 10°C in January to 38°C in April, and relative humidity ranged from 50% to 65% during the sampling months.

Call of the ensiferan males was recorded in the field in the evening between 4:00 and 9:00 pm. Individual calling insects were first tracked by ear and located. Recordings were made by holding a digital recorder (TASCAM DR-08, TEAC, America Inc., USA, 44.1 kHz, 16 bit, .wav format) at a distance of 25 cm from the calling animal. As the calling orthopterans are active only in the evening, the acoustic sampling was restricted to 3 h per evening for a total of 42 days. Only two individuals of a call type were preserved in 70% alcohol for taxonomic identification and the rest were released back in the place where they were captured. Song analysis was performed using the signal processing software RAVEN Pro 1.4 (Cornell Lab of Ornithology, Ithaca, NY, USA) and Spectra Plus 5 (Pioneer Hill Software, Poulsbo, WA, USA) for temporal and spectral analysis.

Pitfall traps were laid in the same locations where bioacoustics sampling was carried out previously. Cylindrical plastic pots of diameter 17 cm and depth 16 cm were used as pitfall to catch orthopteran and other insects. Each pit was covered with a funnel to make sure that the captured insect does not jump out. A non-invasive method of pitfall trap was used to avoid unnecessary killing of invertebrate species. Pitfall traps without any chemical preservative have been demonstrated as a viable alternative to trap Orthoptera species previously[17]. Each trap was monitored every [illegible] day (spanning a period of 42 days) to check for captured insects. Captured invertebrates were photographed for [illegible] placement, and invertebrates trapped in the [illegible] were counted and released back in the field but away from the pit. In case of Orthoptera, two individuals per species were preserved. A total of 50 pits were laid for data collection. However, over a period of time 27 pits were stolen and hence, sampling had to be abandoned for these sites. Hence a comparison between the two methodologies, i.e. acoustic and pitfall sampling is limited to a period of four months.

[illegible] were identified up to the genus level using keys in Chopard[18]. [illegible] were classified till order level using entomology keys[19]. A standardized abundance of each taxon was estimated by dividing the number of individuals in each taxon by the sampling effort (number of pits) to correct for [illegible] effort in

Table 1. [illegible]

Ensifera species	S1	S2	S3	S4	Total no. of individuals
1. Superfamily: Grylloidea					
Family: Gryllidae					
Gryllodes sp.	1	1	1	1	4
Gryllus bimaculatus	–	–	–	1	1
Gryllus X	1	1	2	2	6
Gryllus Y	–	–	–	1	1
Family: Trigonidiidae					
Diatrechus sp.	1	1	1	1	4
2. Superfamily: Gryllotalpoidea					
Family: Gryllotalpidae					
Gryllotalpa sp.	1	1	1	2	5
Total individuals	4	4	5	10	23