VIDYABHARTI SANSTHA, WARDHA.
DR. R. G. BHOYAR ARTS, COMMERCE & SCIENCE COLLEGE
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(FORMERLY VIDYABHARTI COLLEGE)
Affiliated To Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur.
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3.3.1 Number of research papers published per teacher in the Journals notified on UGC website during the last five

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1	A Comparative description between new record of dragonfly *Burmagomphus pyramidalis* Laidlaw from Central India and earlier available record	Ashish D. Tiple, Sonali V. Padwad and S. S. Talmale	Zoology	Ambient Science	2017	2348-5191	https://www.caves.res.in/	https://www.caves.res.in/journal/articles/Amb_Sci_04(2)_Ra01.pdf	UGC-Care
2	New locality records of a rare Dragonfly *Gynacantha khasiaca* Maclachlan, 1896 (Odonata Aeshnidae) from India	Payra A., Das D. N., Pal A., Patra D. and Tiple A.D	Zoology	Biodiversity Journal	2017	2039-0394	https://www.biodiversityjournal.com/	https://www.biodiversityjournal.com/pdf/8(1)_27-32.pdf	UGC-Care/Web of Science
3	Influence of micro and macro elements of BG-11 medium on groth of characium ambigum	K N Pathade	Botany	International Journal of advance and innovative research	2017	2394-7780	https://ijairjournal.in/	https://ijairjournal.in/	UGC-Care

4	A logical explanation of structurally unfit X-ray diffraction peaks in nanoferroelectrics	C M Dudhe, B K Sakhare, S S Panchabhai, S J Khambadkar, N V Dhoke, C P Chaudhary, U A Palikundwar	Physics	Bulletin Material Science	2018	0973-7669	https://www.springer.com/journal/12034	https://link.springer.com/article/10.1007/s12034-017-1528-4	UGC-Care/Scopus
5	New Localities of Square Spotted Gecko, *Hemidactylus Gracilis* Blanford, 1870 (Squamata: Sauria: Gekkonidae) With Habitat, Distribution and Conservation Status, From Maharashtra, India.	Parag H Dandge and Ashish D Tiple	Zoology	International Journal of Research In Biosciences , Agriculture and Technology	2018	2347-517x	https://ijrbat.in/?url=abstract_view&title	https://ijrbat.in/?url=abstract_view&title=NEW%20LOCALITIES%20OF%20SQUARE%20SPOTTED%20GECKO,%20HEMIDACTYLUS%20GRACILIS%20BLANFORD,%201870%20(SQUAMATA:%20SAURIA:%20GEKKONIDAE)%20WITH%20HABITATS,%20DISTRIBUTION%20AND%20CONSERVAT	UGC-Care
6	Morphology of immatures of Aphodius (Neocalaphodius) moestus (Fabricius, 1801) (Coleoptera: Scarabaeidae: Aphodinae)	Khadakkar, S. S., Tiple, A. D. & Khurad, A. M	Zoology	Munis Entomology & Zoology	2018	1306-3022	https://www.munisentzool.org/	https://www.munisentzool.org/Issue/abstract/morphology-of-immatures-of-aphodius-neocalaphodius-moestus-fabricius-1801-coleoptera-scarabaeidae-aphodinae_1220	Web of Science /UGC-Care
7	Butterfly diversity in relation to a relative abundance and status in Seloo city, Wardha Maharashtra, Central India	Ashish D. Tiple	Zoology	International Journal of Research In Biosciences, Agriculture and Technology	2018	2347-517x	https://ijrbat.in/	https://ijrbat.in/upload_papers/261220180522031%20Ashish%20Tiple.pdf	UGC-Care
8	Butterflies (Lepidoptera Rhopalocera) of the Bor WildlifeSanctuary, Wardha, Maharashtra, Central India	Ashish D. Tiple	Zoology	Biodiversity Journal	2018	2039-0394	https://www.biodiversityjournal.com/	https://www.biodiversityjournal.com/pdf/9(3)_171-180.pdf	UGC-Care/Web of Science

9	Description of life stages of dung beetle Scaptodera rhadamistus (Fabricius, 1775) (Coleoptera: Scarabaeidae: Scarabaeinae) with notes on nesting and biology	Khadakkar, S.S., A.D. Tiple& A.M. Khurad	Zoology	Journal of Threatened Taxa	2018	0974-7907	https://www.threatenedtaxa.org/	https://www.threatenedtaxa.org/index.php/JoTT/article/view/3935	UGC-Care/Scopus
10	Comparative study of economic parameters of different silkworm races of Bombyx mori l. After drug treatment	K. P. Ganvir, M. K. Rathod & M. M. Rai	Zoology	International Journal of advance & Innovative research	2019	2394-7780	https://ijairjournal.in/	https://ijairjournal.in/	UGC-Care
11	Rural marketing in India	Parag Kawley & Priti Nanotkar	Commerce	Printing Area	2019	2394-5303	https://www.vidyawarta.com/03/	https://www.vidyawarta.com/03/	UGC-Care
12	Planning for climate change in Urban areas: a conceptual framework	Parag Kawley	Commerce	Ajanta	2019	2277-5730	http://www.sjifactor.com/passport.php?id=18979	http://www.sjifactor.com/passport.php?id=18979	UGC-Care
13	Investment or insurance: a common man's perspective in India	Parag Kawley	Commerce	Ajanta	2019	2277-5731	http://www.sjifactor.com/passport.php?id=18979	http://www.sjifactor.com/passport.php?id=18979	UGC-Care
14	A design of novel synthesis of p-phenyl isonitroso acetophenone and their antimicrobial activity	R D Raut & Wasim Khan	Chemistry	Technical Research Organization India	2019	2394-0697	http://www.troindia.in/Journals-2.html	http://www.troindia.in/Journals-2.html	UGC-Care
15	Silica Boric acid (Sio2-H3BO3): a mild, efficient and reusable heterogeneous catalyst for BOC protection of amines	S M Thorat, Wasim Khan & M T Sangole	Chemistry	Technical Research Organization India	2019	2394-0698	http://www.troindia.in/Journals-2.html	http://www.troindia.in/Journals-2.html	UGC-Care

16	Scarab Beetles (Coleoptera: Scarabaeoidea: Scarabaeidae) of Vidarbha, India, with Notes on Distribution.	Khadakkar, S. S., Tiple, A. D.& Khurad, A. M.	Zoology	Proceedings of the National Academy of Sciences, India - Section B: Biological	2019	2250-1746	https://link.springer.com/article/10.1007/s40011-018-1035-4	https://link.springer.com/article/10.1007/s40011-018-1035-4	UGC-Care/Scopus
17	Diversity, seasonal distribution and status of butterflies in satpuda botanical garden, Nagpur, central India	Ashish D. Tiple	Zoology	International Journal of Advance and Innovative Research	2019	2394-7780	http://www.iaees.org/	http://www.iaees.org/publications/journals/arthropods/articles/2014-3(2)/butterfly-diversity-of-Gorewada-International-Bio-Park.pdf	UGC-Care
18	Odonata fauna in adjoining coastal areas of Purba Medinipur District, West Bengal, India.	Payra, A. and Tiple, A. D.	Zoology	Munis Entomology & Zoology	2019	1306-3022	https://www.munisentzool.org/	https://www.munisentzool.org/	UGC-Care/Web of Science
19	Metal/Metal Oxide Nanoparticles: Toxicity, Applications, and Future Prospects.	Chaudhary, R. G., Bhusari, G.S., Tiple, A. D., Rai, A. R., Somkuvar, S. R., Potbhare, A. K., Lambat,	Zoology	Current pharmaceutical design	2019	1873-4286	http://www.eurekaselect.com/journal/29	http://www.eurekaselect.com/journal/29	UGC-Care/Scopus
20	Pachliopta aristolochiae	Rushbrooke, M., Jangid, A.K., Alwis, C., Barve, V., Chowdhury, S., Irungbam, J.S.,	Zoology	The IUCN Red List of Threatened Species	2019	2307-8235	https://www.iucnredlist.org/	https://www.iucnredlist.org/	UGC-Care/Scopus
21	Pachliopta hector	Fernando, E., Jangid, A.K., Alwis, C., Chowdhury, S., Jayasinghe, H.D., Kehimar, I., Kunte,	Zoology	The IUCN Red List of Threatened Species	2019	2307-8235	https://www.iucnredlist.org/	https://www.iucnredlist.org/	UGC-Care/Scopus
22	Pachliopta pandiyana	Fernando, E., Jangid, A.K., Kehimar, I., Kunte, K., Moonen, J. & Tiple, A.D.	Zoology	The IUCN Red List of Threatened Species	2019	2307-8235	https://www.iucnredlist.org/	https://www.iucnredlist.org/	UGC-Care/Scopus

23	Synthesis of 2-Aryl-3-[4/-Phenyl hiazolidinyl]-4-OxoThiazolidines	Dr.Vibha Nikose and M. N. Narule	Chemistry	Journal of Gujrat Research Society	2019	0374-8588	http://www.gujaratresearchsociety.in/index.php/JGRS/article/view/1722	http://www.gujaratresearchsociety.in/index.php/JGRS/article/view/1722	UGC-Care
24	PROGRESSION DEVELOPMENT OF FAMILY BUSINESS: THE ENTREPRENERURIAL	Parag R. Kawley	Commerce	AJANTA	2019	2277-5730	http://www.sijifactor.com	https://www.sijifactor.com	UGC-Care
25	ROLE OF E-COMMERCE & IMPROVEMENT OF MARKET DEVELOPMENT IN INDIA	Parag R. Kawley and Preeti W. Nanotkar	Commerce	PRINTING AREA	2019	2394-5303	https://www.vidyawarta.com/03/	https://www.vidyawarta.com/03/	UGC-Care
26	Reading of Vikas Swarup's 'The Accidental Apprentice' in the light of Socio-Cultural Problems in India	Mr. Vaibhao B. Pimpale And Hitendra B. Dhote	English	Journal of The Gujrat Research Society	2019	0374-8588	http://www.gujaratresearchsociety.in/index.php/JGRS/article/view/961	http://www.gujaratresearchsociety.in/index.php/JGRS/article/view/961	UGC-Care
27	Synthesis, Characterization & Antimicrobial Studies of Platinum (II), Palladium (II) And Fe (II) Complexes with Newly Synthesised Ligand p- Phenyl Isonitroso Acetophenone	Khan W.A. and R.D. Raut	Chemistry	Journal of Emerging Technologies and Innovative Research	2020	2349-5162	www.jetir.org/view?paper=JETIRDI06061	www.jetir.org/view?paper=JETIRDI06061	UGC-Care
28	A Study of Personal Selling & Sales Management a Connection Marketing Outlook	Parag R. Kawley and Preeti W. Nanotkar	Commerce	RAINBOW	2020	2394-6903	https://journal.unnes.ac.id/sju/index.php/rainbow	https://journal.unnes.ac.id/sju/index.php/rainbow	UGC-Care

29	A review on Nanotoxicology: Aquatic environment and biological system	Tiple, Ashish D., V.J. Badwaik, Sonali V. Padwad, Ratiram G. Chaudhary, and N. B. Singh	Zoology	Materials Today: Proceedings	2020	2214-7853	https://www.sciencedirect.com/	https://www.sciencedirect.com/science/article/pii/S2214785320343686	UGC-Care/Scopus
30	Report on the 10th South Asian Dragonfly Meeting and Symposium 2018.	Andrew R. J., Tiple A. D. , Mujumdar N., Koparde P.	Zoology	Agrion	2020	1476-2552	https://worlddragonfly.org/wp-content/uploads/docs/agrion/Agrion_22-1_Jan2018_lq.pdf	https://worlddragonfly.org/wp-content/uploads/docs/agrion/Agrion_22-1_Jan2018_lq.pdf	UGC-Care/Web of Science
31	An Updated list of odonata species from Athgarh Forest Division, Odisha, eastern India (Insecta: Odonata)	Payra, A., Dash, S. K., Palei, H. S. Tiple, A. D., Mishra, A. K., Mishra, R. K. &	Zoology	Mong. J. Biol. Sci.	2020	1684-3908	https://www.biotaxa.org/mjbs/article/view/62893	https://www.biotaxa.org/mjbs/article/view/62893	UGC-Care/Web of Science
32	First Record of Epophthalmiafrontalis from Central India (Insecta: Odonata: Macromiidae).	Tiple AD, Payra A	Zoology	Travaux du Muséum National d'HistoireNaturelle"GrigoreAntipa"	2020	2247-0735	https://travaux.pensoft.net/	https://travaux.pensoft.net/article/52897/	UGC-Care/Web of Science
33	Dragonflies and Damselflies (Odonata: Insecta) of the Bor Wildlife Sanctuary, Wardha,Maharashtra, Central India	Ashish Tiple	Zoology	Travaux du Muséum National d'HistoireNaturelle "GrigoreAntipa"	2020	2247-0735	https://travaux.pensoft.net/	https://travaux.pensoft.net/article/52922/	UGC-Care/Web of Science
34	Buterfy (Lepidoptera: Rhopalocera) fauna of Jabalpur City, Madhya Pradesh, India	Flora, J.S., A.D. Tiple, A. Sengupta& S.V. Padwad	Zoology	Journal of threatened Taxa	2020	0974-7907	https://threatenedtaxa.org/JoTT	https://threatenedtaxa.org/JoTT/article/view/4168	UGC-Care/Scopus

35	Shoot induction and daidzein production in *Desmodium gangeticum* (L.) DC by using different Concentrations of Kinetin.	Patil V. N. and Deokule, S.S	Botany	Int. Res. Jour. of Science & Engineering,	2020	2322-0015	https://www.irjse.in/	https://www.irjse.in/ICRSCSD_2020/4.%20Article%20Text-20-Patil.pdf	UGC-Care
36	Food Security In Maharashtra: Regional Disparities	Prof. Dr. Parag R. Kawley	Commerce	Mukt Shabd Journal	2020	2347-3150	http://www.isec.ac.in	http://www.isec.ac.in/WP%20264%20-%20Nitin%20Tagade-Final.pdf	UGC-Care
37	Some Floristic Diversity In Vidyabharti College Campus, Seloo, Dist. Wardha (Maharashtra) India.	Patil V. N	Botany	Oxford Journal of Science and Research	2020	2581-9380	http://www.tojsr.org/	http://www.tojsr.org/	UGC-Care
38	Removal of Arsenic using Cyanobacterial species by Continuous Flow Fixed Bed Bioreactor System	Dr. Shilpa Mankar	Microbiology	Alochana Chakra Journal, International	2020	2231-3990	https://www.scribd.com	https://www.scribd.com/document/373098453/Removal-of-Arsenic-by-Cyanobacterial-Species-in-Static-Culture-Condition#	UGC-Care
39	Comparative Study of Estimation of Gibberellic acid (GA3) by Analytical Methods	Dr. Kshama Murarkar	Microbiology	Alochana Chakra Journal, International	2020	2231-3990	https://www.scribd.com	https://www.scribd.com/document/373098453/Removal-of-Arsenic-by-Cyanobacterial-Species-in-Static-Culture-Condition#	UGC-Care
40	A review on Nanotoxicology: Aquatic environment and biological system	Vaishali J Badwaik	Zoology	Material today : Proceeding	2020	2214-7853	https://www.sciencedirect.com	https://www.sciencedirect.com/science/article/pii/S2214785320343686	UGC-Care
41	A Comparative Study of Innovations and Agricultural reforms towards Digital India	Dr. Siddhartha D. Nagdive	Commerce	Journal of Interdisciplinary Cycle Research	2020	0022-1945	https://jicrjournal.com/	https://jicrjournal.com/VOLUME-XII-ISSUE-1-JANUARY-2020-SP-1/	UGC-Care

42	Green synthesis of Novel substituted 4, 4- Biphenothiazine Derivative	Vibha M. Nikose	Chemistry	Journal of Applicable Chemistry	2020	2278-1862	http://www.joac.info	http://www.joac.info/ContentPaper/2020/6-9-6-2.pdf	UGC-Care
43	Bibliometric and bibliometrics law	K.S. Dambhare	Library	Vidyawarta	2020	2319-9318	https://www.vidyawarta.com	https://www.vidyawarta.com/02/?cat=1&paged=2	UGC-Care
44	Green Marketing Execution In India – A Current Scenario	Prof. Dr. Parag R. Kawley	Commerce	Vidyawarta Journal,	2021	2319-9318	https://www.worldwidejournals.com	https://www.worldwidejournals.com/paripex/recent_issues_pdf/2015/January/January_2015_1421670936__67.pdf	Peer reviewed
45	A Study of Diurnal Variation of Agility of Kabaddi Players	Dr. Shashank G. Nikam	Physical Education	B. Aadhar	2021	2278-9308	Link is not available	Link is not available	UGC-Care
46	E-Learning Resources in Rural Development : Current Scenario	Dr. Shashank G. Nikam	Physical Education	B. Aadhar	2021	2278-9308	Link is not available	Link is not available	UGC-Care
47	Microstructure characterization of male and female external genitalia of soapberry bug, Leptocoris augur (Hemiptera: Rhopalidae)	Vaishali J Badwaik	Zoology	Journal of applied biology and biotechnology (JABB)	2021	2455-7005	https://jabonline.in	https://jabonline.in/abstract.php?article_id=633&sts=2	UGC-Care
48	An Analytical Study Of Institutional Infrastructure for Export Promotion: Issues and Implications	Dr. Siddhartha D. Nagdive	Commerce	Rainbow: - Multidisciplinary Peer Reviewed Annual Journal	2021	2394-6903	https://www.nepjol.info/index.php/rainbowj	https://www.nepjol.info/index.php/rainbowj	UGC-Care

49	Lost in Time: Re-description and Ecological Re-assessment of two Indian Endemic Elattoneura Cowley, 1935 (Platycnemididae) Damselflies	Koparde, P., Halali, S., Tiple, A., Ranganekar, P., Sonawane, A., Payra, A., Dawn, P., Raju, A. and Subramanian, K.A.	Zoology	International Journal of Odonatology	2021	13887890, 21596719	https://www.wachholtz-verlag.de/en/Open-Access/Biology-OA/International-Journal-of-Odonatology	https://www.wachholtz-verlag.de/en/Open-Access/Biology-OA/International-Journal-of-Odonatology/Lost-in-Time-Re-description-and-Ecological-Re-assessment-of-two-Indian-Endemic-	Scopus
50	Impact of Global Economic Recession on Indian Economy : Current Scenario	Dr. Parag R. Kawley	Commerce	AJANTA	2021	2277-5730	https://www.sijifactor.com	https://www.sijifactor.com	UGC-Care
51	A Competent and An Economically Cheap Synthesis of Amides Catalyzed By Calcium chloride	W.A.Khan	Chemistry	Journey of Advance Scientific Research	2021	0976-9595	https://www.sciensage.info	https://www.sciensage.info/index.php/JASR/article/view/1583	UGC-Care
52	Physico-Chemical Analysis of Water Sample From Seloo Tahsil of District Wardha Maharashtra.	W.A.Khan	Chemistry	International Journal Of Scientific Research in Science and	2021	2395-6011	https://www.ijsrst.com	https://www.ijsrst.com/paper/7426.pdf	UGC-Care
53	Physico-Chemical Analysis of Soil Sample From District Wardha	W.A.Khan	Chemistry	International Journal Of Scientific Research in Science and	2022	2395-6011	https://www.ijsrst.com	https://www.ijsrst.com/paper/7426.pdf	UGC-Care
54	The linkage between the second wave of COVID-19 and the severity of mucormycosis in India	Kshama Murarkar and Shilpa Mankar	Microbiology	Journal of applied biology and biotechnology	2021	2455-7005	https://www.bibliomed.org/?mno=90760	https://www.bibliomed.org/mnsfulltext/125/125-1624687497.pdf?1677483426	UGC-Care
55	The linkage between the second wave of COVID-19 and the severity of mucormycosis in India	Kshama Murarkar and Shilpa Mankar	Microbiology	Journal of applied biology and biotechnology	2021	2455-7005	https://www.bibliomed.org/?mno=90760	https://www.bibliomed.org/mnsfulltext/125/125-1624687497.pdf?1677483426	UGC-Care

56	An initial checklist of the ants (*Hymenoptera:* formicidae) and their specific distribution from district Wardha, Maharashtra, India	Vaishali badwaik	Zoology	Science Archives	2022	2582-6697	http://sciencearchives.org/	http://sciencearchives.org/wp-content/uploads/2022/05/Science-Archives-2022-Vol.-3-2-88-93-1.pdf	UGC-Care
57	Dragonflies and damselflies (Insecta: Odonata) of Jabalpur, Madhya Pradesh, India.	Ashish Tiple, V. Sharma and S. V. Padwad	Zoology	Journal of Threatened Taxa	2022	0974-7907	https://threatenedtaxa.org/JoTT	https://threatenedtaxa.org/JoTT/article/view/7306	UGC-Care/Scopus
58	Lead free single – double perovskite composite towards room temperature multiferroicity	P.R. Chaudhari	Physics	Materials Chemistry and Physics	2022	1879-3312	https://doi.org/10.1016/j.matchemphys.2021.125326	https://www.elsevier.com/locate/matchemphys	UGC-Care/Scopus
59	Optimizing first-, second- and third- order optical traits of zinc tris-thiourea sulphate (ZTS) cristal by L-tyrosine for photonic device applications	M Anis, GG Muley, M I Baig, W A Khan, S P Ramteke and E E S massoud	chemistry	Indian Journal of Physics	2022	0974-9845	https://link.springer.com/	https://link.springer.com/article/10.1007/s12648-022-02381-5	UGC-Care
60	'*Ehetia laevis* Leaves: Potential Herbal Remedy for Mouth Microflora'	K. Murarkar, S. Khadse, & S. Mankar	Microbiology	Indian Journal of Traditional Knowledge	2022	0975-1068	http://op.niscair.res.in/index.php/IJTK/article/view/29345	http://nopr.niscair.res.in/handle/123456789/59663	It is listed in UGC Care list
61	Effect of locally generated food waste on bioconversion and nutrient parameters of black soldier fly larvae, *Hermetia illucens* L.	K P Ganvir, A N Darvekar V D Raut and R K Thorat	Zoology	Journal of entomology and zoology studies	2022	2320-7078	https://www.entomoljournal.com/	https://www.entomoljournal.com/archives/2022/vol10issue6/PartB/10-5-51-244.pdf	Peer reviewed

62	Sustainable development through decent jobs for youth	Sanajy Dhoke & Parag Kawley	Commerce	International Journal of advance and applied research	2022	2347-7075	www.ijaar.co.in	https://sustainabledevelopment.un.org/partnership/?p=7891	UGC Care list
63	Young patient's chronic fever	K. Murarkar, S. Mankar, S Warthi,Y. Kapse, K. Kataria, J.Moon, K. Ganvir	Microbiology	International Journal Of Microbial Science	2022	2582-967X	https://theijms.com	http://doi.org/1055347/theijms.v3i1	UGC-Care
64	Young patient's chronic fever	K. Murarkar, S. Mankar, S Warthi,Y. Kapse, K. Kataria, J.Moon, K. Ganvir	Microbiology	International Journal Of Microbial Science	2022	2582-967X	https://theijms.com	http://doi.org/1055347/theijms.v3i1	UGC-Care
65	Dragonflies and damselflies (Odonata: Insecta) of the Seloo city, Wardha, Maharashtra, Central India	Ashish D. Tiple, Bhende, R., & Dandge, P	Zoology	Arthropods	2022	2224-4255	https://agris.fao.org/	https://agris.fao.org/agris-search/search.do?recordID=DJ20220826895	UGC-Care

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A logical explanation of structurally unfit X-ray diffraction peaks in nanoferroelectrics

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Abstract. In the present paper we suggest the cause and solution of some unidentified X-ray diffraction (XRD) peaks in ferroelectric nanoparticles. Indeed, a relationship between the structurally unfit XRD peaks and domains in the ferroelectric nanoparticles is suggested. $BaTiO_3$, $PbTiO_3$ and $Sr_{0.5}Ba_{0.5}Nb_2O_6$ nanoparticles were used as trial samples. Diffraction of X-rays by domain grating was considered for the occurrence of unfit peaks. It was found that domain widths corresponding to some structurally unfit minor peaks of all three trail samples show good agreement to the values estimated from the transmission electron microscopy images. The study can be used to estimate the width of nanodomains (within 5–10 Å) in ferroelectric nanoparticles. Thus, the study seems to be highly important for the advancement of nanoferroelectricity.

Keywords. X-ray diffraction; domains; ferroelectrics; nanoparticles; transmission electron microscopy.

1. Introduction

Inorganic ferroelectric single crystals have been extensively studied for applications like piezoelectric filters, pyroelectric detectors, imaging devices, optical memories, modulators, etc. [1,2]. These applications are due to their excellent dielectric non-linearity, polarization reversal, photorefractive, piezoelectric and domain dynamic properties [1,2]. Despite such prosperous background, as far as the contribution in nanotechnology and nanodevices is concerned, ferroelectrics seem to be lagging behind. This is probably due to the negative results of some initial investigations [3–5].

At the end of last century, Zhong *et al* [3], Chattopadhyay *et al* [4] and Sun *et al* [5] reported that the ferroelectric behaviour disappears when the size of the particles reduces to a nanoscale. Although at later stages such problems were resolved by means of many experimental studies [6–12], progress lagged. Another problem that creates some kinds of hurdles for researchers in the field of nanoferroelectrics is the presence of unknown diffraction peaks in powder X-ray diffraction (XRD) pattern. We also experienced such problems in $BaTiO_3$ and $PbTiO_3$ nanoparticles [9,11]. Up to the limited value of relative intensity, such peaks can be ignored just by stating 'insignificant minor peaks due to weak unknown phase or impurity'. However, the presence of such peaks induces some kinds of uncertainty about the synthesis technique and/or structure of nanoparticles. This may hamper the progress of research in the field of nanoferroelectrics.

Earlier in 1948, Kay [13] observed the effect of twinning on X-ray pattern. He found that due to twinning, the single spots on an X-ray photograph are replaced by pairs or a more complex group. It was also noted in the literature that the microstructure affects the intensity of reflection [14]. Later in 2000, Ingle and Patil [15] suggested that the presence of twin planes is a possible cause of unknown peaks in XRD pattern of ferroelectric material. These evidences indicate that there is a definite effect of twinning and hence domain structures on XRD pattern of the ferroelectrics since twinning process leads to formation of domains in the crystals.

Unfortunately, the matter remained unnoticed and no further correlation on this part of the research is reported. This is mainly because of dimension of domains. In single crystals, generally the dimension of domains is on the order of a micrometre, which is too large as compared with the wavelength of X-rays. Hence, every part of polydomain crystal under the field of view of X-ray beam seems to be a single domain and hence observations of said kind are infrequent. However, in nanoparticles, as the existence of nanodomains with the dimension comparable to the X-ray wavelength is possible, the effect will be frequent if they arrange themselves in a grating-like form. Thus, the interaction between the domains and X-ray can be distinguished.

In the present work, we conducted the titled study on some ferroelectric nanoparticles and a relation between domain structure and unknown XRD peaks was established. The study provides the information of whether small domains on the

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New locality records of a rare Dragonfly *Gynacantha khasiaca* Maclachlan, 1896 (Odonata Aeshnidae) from India

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ABSTRACT *Gynacantha khasiaca* Maclachlan, 1896 (Odonata Aeshnidae) is a beautiful dragonfly, distributed mainly in South-eastern Asia. During Odonata survey in different parts of North-Eastern and Eastern India from 2014 to 2016, some specimens of this species were observed and photographed from 6 localities. Present record of this species from Purba Medinipur, West Bengal represents its Southernmost distribution in India.

KEY WORDS Aeshnidae; distribution; dragonflies; observation; Purba Medinipur.

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INTRODUCTION

Dragonflies and damselflies (Order Odonata) are the prominent and colorful insects of wetlands with long, slender abdomen, commonly known as aerial predators, hunting by sight. These are mostly found around the vicinity of freshwater habitats like rivers, streams, marshes, lakes and even small pools and rice fields. As predators it plays an important role in wetland and terrestrial food chains. Dragonflies are reliable indicators of overall ecosystem health and also good Biocontrol agents (Andrew et al., 2009; Tiple et al., 2013). Worldwide, 5952 species under 652 genera of odonates have been reported, of which 477 species, 50 subspecies in 142 genera and 18 families are known from India (Subramanian, 2014; Nair & Subramanian, 2014; Kiran et al., 2015; Emiliyamma & Palot, 2016).

Among dragonflies, the genus *Gynacantha* Rambur, 1842 are large in size, pale brown and green in colour and are crepuscular by nature (Fraser, 1936). The genus *Gynacantha* with 92 species is distributed throughout the world, especially in the tropics and subtropics region (Asahina, 1993; Schorr & Paulson, 2016). Among them about 30 species are known from the South-eastern Asia and in India the genus *Gynacantha* is represented only by 13 species (Subramanian, 2014; Khan, 2015a). This distribution range of *G. khasiaca* Maclachlan, 1896 is known from India (Mitra, 2002), Nepal (Vick, 1989) and Myanmar (Fraser, 1936), and possibly Tibet (Martin, 1909), although this record appears to be suspected by Fraser (1936). According to Mitra (2002), Bangladesh has also been included in the range of this species and Recently Khan (2015b) reported the species from Tilagor Eco Park of Bangladesh and confirmed its distribution in Bangladesh.

MATERIAL AND METHODS

The authors have been documenting the Odonata

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RESEARCH ARTICLE

A Comparative Description between New Record of Dragonfly *Burmagomphus pyramidalis* Laidlaw from Central India and Earlier Available Record

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Study Area: Jabalpur & Hoshangabad District, Madhya Pradesh, India

Coordinates: N 25° 08' 21.48" E 075° 01' 52.52"

Key words: Pachmarhi Biosphere Reserve

Abstract

Burmagomphus pyramidalis Laidlaw, 1922 was reported so far from south to southwest India. Present report of the species from Tropical Forest Research Institute (TFRI) Jabalpur and Pachmarhi Biosphere Reserve (Hoshangabad Dist.), Madhya Pradesh is for the first time from the central parts of India. The study provides here variations in collected *B. pyramidalis* specimens in antehumeral marking on the thorax and the 9th abdominal segment. In specimen two upper antehumeral portion narrow, broaden at middle, again somewhat narrow and broaden at extreme humeral portion touches to the base of 2nd pair of legs, also interrupted at the middle at humeral region as against upper antehumeral portion broad, narrow at middle, and broaden at extreme humeral portion, however, a conspicuous transverse citron yellow band dorsally seen on hind margin. In specimen one 9 abdominal segment with two big yellow triangular marks dorsally present on hind margin. Variations between collected two specimens of *B. pyramidalis* and available description by Fraser (1926 & 1934) are discussed.

Introduction:

The genus *Burmagomphus* was created by Williamson (1907) for a single species, *B. vermiculatus* Martin, earlier described as *Gomphus vermiculatus* (type from Tonkin in Vietnam). Fraser (1934) synonymised Burmese specimens of *vermiculatus* under *williamsoni* Fraser, 1926. Fraser (1934) reported eight species of the genus *Burmagomphus* from the Indian subcontinent (India, Pakistan, Nepal, Bhutan, Bangladesh, Sri Lanka and Myanmar). Schorr & Paulson (2016) in their revised world Odonata list recorded a total of 29 species under the genus distributed throughout the world, but only six species were listed from India viz., *Burmagomphus cauvericus* Fraser, 1926 (Western Ghats), *Burmagomphus hasimaricus* Fraser, 1926 (West Bengal), *Burmagomphus laidlawi* Fraser, 1924 (Western Ghats), *Burmagomphus pyramidalis* Laidlaw, 1922 (Western Ghats), *Burmagomphus sivalikensis* Laidlaw, 1922 (Uttarakhand and West Bengal) and *Burmagomphus vermicularis* (Martin, 1904). The last species *vermicularis* reported first time from Meghalaya, India with doubt by Lahiri (1987) and also Prasad & Varshney (1995) has shown its distribution from Himachal Pradesh and Meghalaya. However, Wilson (2011) and Subramanian (2014) have not shown its distribution in India. Mishra (2007) studied the odonates of Madhya Pradesh and reported a total of 70 species belonging to 40 genera and nine families distributed in different localities. Further, odonates from Madhya Pradesh are documented from Pench National Park and Satpura National Park (Ramakrishna *et al.*, 2006), Kanha National Park (Raju & Narayanan, 2008), Bandhavgarh Tiger Reserve (Mishra, 2009), Pachmarhi Biosphere Reserve (Prasad & Mishra, 2009), Singhori Wildlife Sanctuary (Talmale, 2011), as well as 49 species of odonates with six new records for Madhya Pradesh from the Tropical Forest Research Institute Campus, Jabalpur (Tiple *et al.*, 2012). Tiple (2012) recorded 70 species of odonates from Achanakmar-Amarkantak Biosphere Reserve, Madhya Pradesh and Chhattisgarh, India. Hitherto no species under the genus *Burmagomphus* is so far recorded from Central India (Tiple & Chandra, 2013; Tiple *et al.*, 2013, 2014; Tiple & Koparde, 2015; Dawn & Chandra, 2016). The Tropical Forest Research Institute (TFRI), Jabalpur lies on the bank of the Gour River on

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INFLUENCE OF MICRO AND MACRO ELEMENTS OF BG-11 MEDIUM ON GROWTH OF CHARACIUM AMBIGUM

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ABSTRACT

Algae, the groups of photosynthetic organisms have been observed widely in many natural habitats. Algae obtained all the nutrients from the water in which they live but, they need a proper supply of these nutrients for their successful growth in the culture medium. Nutrients are the substances or certain elements which are essential for life processes in aquatic organisms.

The influences of macro and micro elements of BG-11 medium on the growth of Characium ambigum were studied and constituted the modified BG-11 medium. The auxenic culture was made in the Advanced Phycology and Hydrobiology research laboratory of Botany Department at RTM Nagpur University, Nagpur. The growth of Characium ambigum (O.D.) was higher in modified BG-11 medium (2.135 OD) than the basic BG-11 media (1.715 OD).

Keywords: Algae, BG-11 medium, Modified BG-11 medium.

INTRODUCTION

The environment is to be conditioned to meet their requirement for the successful growth of an organism. Many attempts have been made to understand the ecological condition suitable for their growth (Ketchum, 1954). The studies on the nutritional requirement of algae are quite similar to higher plants. Nutrients are the substances or certain elements which are essential for life processes in aquatic organisms. Major nutrients include carbon, nitrogen, phosphorus, calcium, sodium, magnesium, potassium, sulphur, nitrogen and iron. Micronutrients those required by plants and animals in very small quantity, might include manganese, copper, zinc, cobalt and molybdenum (Horne and Goldman, 1994). In certain algae some additional elements are required such as silica for diatoms.

The absolute requirement of element can be established only by culture. However, many media have been suggested the culture for the growth of algae in media, a few guidelines have also been suggested by Watanabe, *et.al* (2000) and Warren, *et.al*. (2002), several other media are designed to produce a large population by different authors. Rodhe (1948) and Chu (1942) media designed for growth of algae in artificial condition based on the physiological experiment on forms like *Ankistrodesmus falcatus, Pediastrum boryanum* and others. Gerloff, *et. al*., (1950) used media and B.G.11 (Rippka, *et. al*., 1979) for blue green algae.

Nutrient requirement must be absolute normal, minimum or optimum. Ketchum (1949) used several media for growth of *Anacystis nidulans*. Allen (1968); Hirano, *et. al*. (1981); Sorensen, *et. al*.(1977); Stein (1966); Ohad, *et. al*. (1967) for Chlorophyceae, Chrysophyceae, Cyanophyceae and Rhodophyceae.

In considering the requirement of nutrients for the growth of individual alga, at sampling sites maximum concentration of elements are present therefore, an attempt has been made to study the individual element and combination of all elements to assess the requirement of nutrients for *Characium ambigum*.

MATERIALS AND METHODS

Algae from different sites were collected, identified and algal cultures were grown in Advanced Phycology and Hydrobiology Laboratory of the Botany Department. From this mixed population a pure unialgal culture was isolated for the study of nutritional requirement of alga. In this investigation *Characium ambigum* is isolated and made auxenic in liquid BG-11 medium. For study of nutritional requirement of algae, BG-11 medium was chosen as it is considered as a basic or control medium for the Cyanophycean and Chlorophycean algae. For nutritional study elements were selected, carbon, nitrogen, calcium, magnesium, sodium, potassium, sulphur and chloride. The growth was estimated in terms of optical density at 678nm of cell suspension with UV spectrophotometer for *Characium ambigum* for an influence of individual element on growth of *Characium ambigum*. Modified medium was made with combination of all elements for individual algal species and observed the growth as compared to basal medium.

RESULT AND DISCUSSION

Carbon is constituent of all organic compounds, protoplasm and enzyme of living system. It is derived from carbon dioxide, carbonates, bicarbonates or organic compounds. In fact some of these investigators depicted role of bicarbonate and carbon dioxide in *Spirulina, Chlorella* and marine diatom *Phaeodactylum tricornutum*

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COMPARATIVE STUDY OF ECONOMIC PARAMETERS OF DIFFERENT SILKWORM RACES OF BOMBYX MORI L. AFTER DRUG TREATMENT

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ABSTRACT
During large scale rearing of three commercial races, PM x CSR2, CSR2 x CSR4 and CSR4 x CSR2 of Bombyx mori the incidence of bacterial disease was observed mostly during rainy season. Various drugs such as Ampicillin, Chloramphenicol, Streptomycin and Penicillin and standard disinfectant Reshamkeet Aushadh were used against bacteria infected larvae and survival percent, various economic parameters compared and studied. The results obtained from present study showed that, out of the three hybrids, PM x CSR2 hybrid race is most suitable for Vidarbha region even at varied climatic conditions. During the adverse condition, the diseased larvae if treated with Chloramphenicol at early stages of infection, the menace due to disease could be controlled and cocoon crop yield may increase, which might attract more farmers to practice sericulture.
Keywords- Antibiotics, Chloramphenicol, Ampicillin, Streptomycin, Penicillin, Reshamkeet Aushadh.

INTRODUCTION
The newly evolved races CSR hybrids have been introduced in Vidarbha apart of Central India where temperature usually ranged higher as compared to other states. In the beginning of 2000 these hybrids PM x CSR2, CSR2 x CSR4 and CSR4 x CSR2 were introduced on a large scale to improve the cocoon production with less efforts, but these hybrids suffered crop loss at many occasions due to abiotic factors like temperature and biotic factors such as diseases caused by virus, bacteria and protozoa. The silkworm eggs received from National Silkworm Seed organization (NSSO), are screened only for the infection of protozoan pathogen, Nosema bombycis whereas no screening is done for BmNPV and bacterial infection. The transmission of BmNPV and Bacillus sp. was not known till recently, Khurad et al., (2004) reported the transmission of BmNPV virus and Rai et al., (2010) Bacillus sp. transmission from infected parent through embryo to the next generation.

Since the technique is still not known to detect the viral and bacterial infection at an early stage, these pathogens are constantly perpetuating in the silkworm seeds and the culture of onward generation. Hence the present study was undertaken on incidence of bacterial disease mostly during rainy season, control by treatment of drugs and comparative economic characters of hybrids of silkworm, B. mori has been observed. Thereby the most suitable hybrid for Vidarbha region is suggested.

MATERIAL AND METHODS
During mass rearing of silkworm, the larvae with symptoms of bacterial infection were collected and haemolymph of the infected larvae was plated on agar and incubated at room temperature. The colonies of Bacillus sp. grown on the agar were observed, counted and used for further inoculation. A suspension of Bacillus sp. having concentration of about 5 x 10^7particles/ml was prepared. The rearing of silkworm PM x CSR2, CSR2 x CSR4, CSR4 x CSR2 was undertaken and about 350 newly moulted healthy third instar larvae were selected from each hybrid. . All selected larvae were starved for about 10 - 12 hrs before the inoculation with B. sp. Out of selected larvae, 50 larvae from each hybrid kept as control group and fed with piece of mulberry leaf smeared with 2.5 µl of distilled water after air drying. Remaining 300 larvae of each hybrid were provided with mulberry leaf coated with 2.5 µl suspension of 5 x 10^7 Baccilus spore/ml. The larvae, that consumed whole piece of mulberry leaf were separated and further reared by maintaining on fresh mulberry leaves up to cocoon formation. These inoculated larvae from each hybrid separated into six groups of 50 larvae and used for four antibiotic treatment, one group for Reshamkeet Aushadh treatment and one group reared separately as infected group.

Prior to the antibiotic treatment the larvae were screened with four different dosages such as 100, 50, 10 and 4 mg/ml of which 4 mg/ml dose of antibiotic was effective hence preferred. Commercial drugs such as Ampicillin, Chloramphenicol, Streptomycin and Penicillin and standard disinfectant Reshamkeet Aushadh were used against *Baccilus* inoculated larvae. During rearing, survival percent and various economic parameters of antibiotics treated, infected and control group were studied and analyzed.

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Rural Marketing in India –A chronological study

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ABSTRACT

Rural markets of India have acquired consequence, as the taken as a whole development of the Indian nation has resulted into significant raise in the purchasing power of the rural community. It is the known detail that India's 75 per cent of the population reside in rural areas and 58 per cent of the in particular spending come from here. Rural Indians are capable to generate consequential command to the country's urban division. There are Increase in incomes, growing non-farm employment opportunities; higher aspirations and the Government's hub on rural sustainability schemes are main factors that have been dynamic the rural markets' development.

Key words: Rural market, Marketing Practices.

INTRODUCTION

It is the known fact that India's 75 per cent of the population resides in rural areas and 58 per cent of the in general consumption comes from there. Rural Indians are capable to generate important demand to the country's urban division. There are Increase in incomes, increasing non-farm employment opportunities, higher aspirations and the Government's hub on rural sustainability schemes are most important factors that have been dynamic the rural markets' expansion. Rural expenses was considerably higher at Rs 4,73,000 crores than urban consumption at Rs 3,98,600 crores between 2010-11 and 2012-13; in which rural using up per person outpaced its urban equivalent by 3 per cent, according to a study by CRISIL and preliminary data released for 2012-13 by the National Sample Survey Organization (NSSO).

The authentic income of rural households is expected to increase from 3.8% in the past two decades to 4.6% in the next two. Higher incomes and revelation to urban lifestyles have also raised the aspirations of the rural laypeople, as they endeavor to advance their worth of life by gaining entrance to new technologies, products and services.

Rural Markets in India :

The conception of Rural Marketing in India financial system has played a significant role in the lives of people. The rural market in India is not a split article in itself and it is extremely partial by the sociological and behavioral factors in use in the country. Rural marketing determines the moving out of business behavior bringing in the stream of goods from urban sectors to the rural regions of the country as well as the advertising of diverse products manufactured by the non-agricultural human resources from rural to urban areas. The rural market in India is enormous, speckled and offers a plethora of opportunities in evaluation to the urban sector. It covers the highest population and regions and by this means, the highest number of consumers.

Objectives:

To study the scenery of Indian rural marketing

To consider the rural marketing in India

RURAL MARKETING CIRCUMSTANCES IN INDIA:

1. FAST MOVING CONSUMER GOODS: FMCG companies have realized a considerable fraction of their sales from rural markets. They account

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15. Planning for Climate Change in Urban Areas : A Conceptual Framework

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Abstract

Climate change poses a serious threat to sustainable urban development, placing many cities at risk. Consequently, city authorities face the challenge of finding ways to include adaptation strategies into their work, although related knowledge and competence is still scarce and fragmented. With the aim of contributing to knowledge development and organizational learning, the objective of this paper is to critically review and compare current theoretical and practical approaches to adaptation planning in cities. First the conceptual characteristics and features of a climate-resilient city are identified. Second, the reciprocal linkages between climate-related disasters, urban form and city planning processes are analysed – by taking into account the life cycle of disasters from causes, to short- and long-term impacts, and post-disaster response and recovery. Finally, urban adaptation measures proposed for both developed and so-called developing countries are assessed. On the basis of the differences, gaps and synergies identified between theoretical and practical approaches to adaptation planning, the implications for improving sustainable urban transformation are discussed.

Keywords: Adaptation, Climate Change, Disaster, Risk Reduction, Urban Planning, Urban Resilience.

Introduction

Climate change poses a serious threat to sustainable urban development, placing many cities at risk. The worldwide rate of so-called natural disasters has almost quadrupled in the last 35 years, resulting in escalating human and economic losses. Despite many uncertainties concerning the magnitude and frequency of hazards, and their specific impacts, climate change will inevitably increase the susceptibility of urban societies if no effective adaptation takes place. Historically, cities have been and often still are perceived as providing refuge from disasters and as buffers against environmental change. Today, however, they are better described as risk and disaster hotspots. The environmental changes humanity faces are deeply intertwined with complex urbanization processes and happen at a previously unseen rate and magnitude.

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8. Investment or Insurance: A Common Man's Perspective in India

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Abstract

One big question in common man's life is: Which one you should prioritize: Insurance or Investment? Some people are either inclined to both of them. Some of them are so eager about any types of financial investments that could give them good reward and security in the long run. Example of these investments is stocks, gold, etc; while some are so concerned about having insurance in life. Some people claim insurance is an investment. Yes in some cases like for example a life insurance. Technically investment means:

Putting money into an asset and then grabbing the rewards later. A good example is when you buy a certain piece of real estate for a certain amount; when the price increase in the long run, if you sell it; you can reap profits or rewards. Remember that you have control when to liquidate or sell your investments. On the other hand, insurance means: 1.) Putting money into in the hope that when there is an emergency you will never run out of cash or your dependents. A good example is that if someone is hospitalized you will only pay a little and the insurance will pay the entire amount. Hence they are vice, but not versa.

Key Words: Insurance Sector, Investment, Bonds, Stocks, Mutual funds, Risks involved in insurance.

Introduction

Any well designed personal financial plan should include life insurance, savings and investments. Sometimes the lines that separate these three distinct financial products get blurred, because certain types of life insurance include saving and investing components. When it comes to planning your budget, examine all three of these categories separately for best results.

Identification

Savings is money that you set aside for emergencies or for big ticket items. These funds should be kept in a safe account that is readily accessible, such as a bank savings or money market account. Investments involve risk, but are also expected to produce a higher rate of return than savings. Investments may include stocks, mutual funds and real estate.

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A DESIGN OF NOVEL SYNTHESIS OF P- PHENYL ISONITROSO ACETOPHENONE AND THEIR ANTIMICROBIAL ACTIVITY

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ABSTRACT

p-phenyl- isonitroso -acetophenone was synthesized. The Co(II), Ni(II) and Cu(II) complexes of ligand p-Phenyl- isonitroso-acetophenone (p-PINAP) have been synthesized and characterized on the basis of elemental analysis, conductivity, magnetic measurement, IR and electronic spectral studies. The conductivity data of the complexes suggests their nonelectrolyte nature. On the basis of these studies complexes of formula Co(P-PINAP)$_2$, Ni(P-PINAP)$_2$, and Cu(P-PINAP)$_2$ have octahedral geometry

Keywords: Cu(P-PINAP)$_2$, p-phenyl-isonitroso- actophenone , metal, complexes, spectroscopy, antimicrobial activity

1 Introduction

The inclusion of biologically active ligand into organometallic complexes offers much scope for the design of novel drug with enhanced targeted activity.

Isonitroso ketones are of great interest since it has the ability to chelate metal ion through nitrogen and or oxygen donor centers. The interaction of metal ion with ligand containing oxygen and nitrogen as donor atom were undertaken by many chemist. Studies on such complexes indicate that new mechanism of action are possible when combining the bioactivity of the ligand with the properties inherent to the metal by Tomar et al.[1]. With significant development in the field of biological activity of metal chelates plays important role in treatment of biological disorder shown by Mahajan and Patil [2] .

The ligand p-bromo-isonitroso-acetophenone (p-BrINAP) and p-chloro-isonitroso-acetophenone (P-ClINAP) have also been studied by Bhandrakar [3] for few transition metals . Many researchers have screened Pd complexes for anticancer by Ali et al. [4] and antitumor by Malik et al, [5] activities with more or less success. Versatility of Schiff base ligands and biological, analytical and industrial applications of their complexes make further investigations in this area highly desirable. It was also established that the biological activity of Schiff bases is altered many folds on coordination with metal ions shown by Saraf et al. [6]. Keeping the above fact in our mind and in continuation of work on transition metal complexes with Schiff bases.

However, structural studies of the complexes of transition metals with p-phenyl-isonitroso-acetophenone have not been reported yet. The present paper describes the synthesis and characterization of complexes of transition metals Co(II), Ni(II) and Cu(II) with isonitroso p-phenyl-acetophenone on the basis of elemental analysis, IR Spectra, NMR Spectra, Magnetic properties and Antimicrobial activity.

1.1 Material and methods

All chemical used were of analytical grade and of highest purity available and used without further purification. Metal (II) chlorides and acetate salts were also obtained from Merck. Solvents used were distilled and purified before used.

1.1.1: Preparation of Cu (p-PINAP)$_2$: Copper acetate solution was prepared by dissolving 0.199 g. in a minimum quantity of alcohol and equal volume of water was added. Similarly 0.450 g. of p-PINAP was dissolved in a minimum quantity of alcohol. The copper solution was added to the reagent solution drop by drop with constant stirring in conical flask.

PRINCIPAL

SILICA-BORIC ACID (Sio_2-H_3BO_3): A MILD, EFFICIENT AND REUSABLE HETEROGENEOUS CATALYST FOR BOC PROTECTION OF AMINES

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ABSTRACT

An efficient method for *N-tert*-butoxy carbonylation of amines using silica-boric acid (SiO_2-H_3BO_3) as a new catalyst is described. The catalyst is air stable and can be readily separated from the reaction products and recovered for direct reuse.

Keywords: Silica-Boric Acid Catalyst, Protection of amines

1.Introduction

Protection and deprotection plays a pivotal role for the synthesis of complex organic molecules. Amine is one of the most important functional group present in plethora of biologically active compounds. So, its protection plays a crucial role while designing the syntheses of bioactive molecules. Till now, many protective groups have been developed for the amine functionality. Out of these, *N-tert*-butyloxycarbonyl (Boc) has emerged as the most commonly used strategies due to the ease of protection as well as deprotection. This group is stable for various base-catalyzed nucleophilic substitutions and catalytic hydrogenation reactions.[1] Various methods are available for the *N-tert*-butyloxycarbonylation (Boc) under basic as well as Lewis acidic conditions using di-*tert*-butyl-dicarbonate (Boc_2O) that includes I_2,[2] $ZrCl_4$,[3] $HClO_4$-SiO_2,[4] $Zn(ClO_4)_2.6H_2O$,[5] ionic liquid,[6] Amberlyst-15,[7] sulfamic acid,[8] etc. However, most of the methods suffer from one or more drawbacks like highly basic conditions, elevated temperatures, long reaction times and high toxicity. To overcome these drawbacks still there is a need to develop a new catalyst system that can minimise these limitations. Recently, solid supported catalysts have attracted great deal of attention for carrying out important organic transformations. Supported reagents have good thermal and mechanical stabilities. These are more advantageous over homogeneous catalysts as they can be easily recovered from reaction mixture by simple filtration and can be reused several times, making the process more economically and environmentally viable.[9, 10]

One of the few solid supported catalysts is silica supported boric acid (SiO_2-H_3BO_3) as it is a simple, inexpensive reagent recently gaining momentum as a green catalyst in various organic transformations. It possesses environmentally benign properties such as non-toxicity, biocompatibility, recyclability, inexpensive and thermal stability. As an example, Parveen[11] *et al* utilized SiO_2-H_3BO_3 as an efficient solid supported recyclable catalyst for the synthesis of tetrazoles in high yields. Next, this elegant catalyst have been successfully utilized for the synthesis of bis(indolyl)methane derivatives,[12] β-amino carbonyl compounds,[13] etc.

Encouraged by these advantages, we herein report for the first time use of silica-boric acid (SiO_2-H_3BO_3) for *N*-Boc protection of amines. SiO_2-H_3BO_3 catalyst was prepared using standard procedure[14] and the structure was confirmed using IR spectroscopy.

2. Experimental

Preparation of silica supported boric acid: Boric acid (3.0 g) was taken in a 250 ml round bottom flask with 60 mL water and heated to 60-80^{0}C. Silica gel (60-120 mesh, 27.0 g) was added gradually with constant stirring and refluxed for 5 hrs. Water was evaporated under reduced pressure and the residue was stirred at 100°C for 6-7 hrs under vacuum to give free

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NEW LOCALITIES OF SQUARE SPOTTED GECKO, *HEMIDACTYLUS GRACILIS* BLANFORD, 1870 (SQUAMATA: SAURIA: GEKKONIDAE) WITH HABITATS, DISTRIBUTION AND CONSERVATION STATUS, FROM MAHARASHTRA, INDIA.

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ABSTRACT:
Hemidactylus gracilis Blanford 1870 is one of the poorly known endemic geckos from India. Earlier it was reported from Maharashtra (Pune, Yavatmal, Satara and Nashik districts), Madhya Pradesh (Mandala, Shivpuri districts), Chhattisgarh (Raipur) and Andhra Pradesh (Kalavabugga). *Hemidactylus gracilis* comes under IUCN Least Concern category. We observed that it is common in eastern and central Maharashtra. We studied 11 specimens of *Hemidactylus gracilis* from different localities and added eleven new localities for Maharashtra. We also provide some data on its distribution, habitat and threats in Maharashtra.

Keywords: *Hemidactylus gracilis*, new locality, distribution, Maharashtra

INTRODUCTION:

The genus *Hemidactylus* Oken 1817 is one of the most species rich genus of the family Gekkonidae. It is widely distributed genera are found in the tropical, subtropical and oceanic islands regions of the world. About 144 species are documented worldwide of genus *Hemidactylus* (Uetz and Hošek 2016). The Indian subcontinent hosts about 30 species (Bauer et al. 2010; Agarwal et al. 2011; Mirza and Sanap 2010; Murthy et al 2015; Dandge and Tiple 2015; Mirza and Raju 2017). *Hemidactylus* has been highly affected by repeated transmarine colonizations, human activity, spontaneous rafting, which have contributed significantly to the unusually wide distribution range (Smid et al., 2013).

Hemidactylus gracilis Blanford 1870 is poorly known endemic geckos of India. *Hemidactylus gracilis* was described by Blanford in 1871 based on specimens collected from southeast Berar and Raipur in Central Province (now in Chhattisgarh) (Smith 1935). *Hemidactylus gracilis* has been reported earlier from Maharashtra (Nagpur, Mahavali, Pune Wai and Alandi, Satara, Chandrapur, Bilimora and Madhya Pradesh (Mandala and Shivpuri). IUCN assessed *Hemidactylus gracilis* is a Least Concern due to wide distribution of the species and its habitats. Some habitats are under threat due to tourism related infrastructure development (Srinivasulu and **Srinivasulu 2013**).

D'Abreu 1928 was reported this species is common at Nagpur. Murthy (1986); Tikadar and Sharma (1992); Sharma (2002) provided some additional localities for *H. gracilis* in Andhra Pradesh (Kalavabugga, Sugalimatta, Gorgyapurum and Hatkeshwar). Notes on habitat, distribution, natural history, reproduction and phylogenetic relationship were given by Baure et al. (2005). Chandra and Gajbe (2005) reported *H. gracilis* from Mandala and Shivpuri in the state of Madhya Pradesh; they also provided additional localities from Sarguja and Raipur, Chhattisgarh. Recently Mirza and Sanap (2010) reported *H. gracilis* from 'Nashik', Maharashtra.

The present study is an attempt to examine the 11 new different localities from Maharashtra and also provide some data on its distribution, habitat and threat in Maharashtra.

METHOD AND MATERIAL:

Hemidactylus gracilis was surveyed in different areas of Maharashtra states, India from 2008 to 2016. Opportunistic surveys and sightings were

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MORPHOLOGY OF IMMATURES OF *APHODIUS (NEOCALAPHODIUS) MOESTUS* (FABRICIUS, 1801) (COLEOPTERA: SCARABAEIDAE: APHODINAE)

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[Khadakkar, S. S., Tiple, A. D. & Khurad, A. M. 2018. Morphology of immatures of *Aphodius (Neocalaphodius) moestus* (Fabricius, 1801) (Coleoptera: Scarabaeidae: Aphodinae). Munis Entomology & Zoology, 13 (2): 616-621]

ABSTRACT: Immatures of *Aphodius (Neocalaphodius) moestus* (Fabricius, 1801) were studied and compared with *A. arenarius, A. nanus, A. hyxos* and *A. granaries*. The IIIrd Instar larva of *A. moestus* differs in presence of prominent slit on the ventral anal lobe, 1st antennal segment 2 times the length of 2nd antennal segment, presence of 36 to 41 setae on raster and mandible with 1st tooth blunt compared to *A. arenarius, A. nanus, A. hyxos* and *A. granaries*. Eggs are laid freely in dung. As the larval development gets completed, pupation occurs inside the pupal chamber. Pupal chamber is irregularly oblong with pupa on one side of the chamber. Pupa of male differs from that of female in presence of gonopore. The ratio of adult emergence during March and April 2017 was 2f#:1m#.

KEY WORDS: Coprophagous, beetles, white grubs, Maharashtra

Aphodius (Neocalaphodius) moestus (Fabricius, 1801) is widely distributed in Afrotropical, Madagascan, Palaearctic, and Oriental region (Schoolmeesters, 2017).

Immature stages of dung beetle have been studied in temperate countries. But the studies from Asiatic region, Indian subcontinent are restricted to few species only. Adults of dung beetle are always in focus in taxonomy studies. However, immatures can play major role in taxonomy and identification of species. Literature survey lack any description on immature stages of genus *Aphodius* from Indian subcontinent. The endocoprid beetle *Aphodius moestus* is very common in central India but little is known about the immature stages of this species. Description of the immature stages of *Aphodius moestus* is unavailable. This study has been started with a view to study the immature stages of this species. However, *Aphodius hyxos* (Verdu et al., 1997), *Aphodius (Plagiogonus) nanus*, *Aphodius (Plagiogonus) arenarius* (Verdu & Galante, 2000) are some of the Aphodiines whose immatures were documented by earlier authors which were found to be morphologically related.

MATERIAL AND METHODS

Study site. The study was done during March and April months of 2017 in Zilpi village of Wardha district of Maharashtra (India). Zilpi is situated at 21.0658° N, 78.8666° E and approximately 312 m above sea level. The study area is a typical village with ample cattle sheds. Usually, the villagers collect and deposit the cattle dung on pile near the cattle shed.

Sampling. Immatures of *Aphodius moestus* were collected from this area and reared in laboratory till adult to confirm the species identity. Beetles and larvae were removed from dung with blunt forceps.

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RESEARCH ARTICLE

Scarab Beetles (Coleoptera: Scarabaeoidea: Scarabaeidae) of Vidarbha, India, with Notes on Distribution

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Abstract Surveys for collection of scarab beetles of different habitats of the Vidarbha region of Central India were conducted during 2013–2018. A total of 97 species of 39 genera belonging to 07 subfamilies were identified, where 10 species were newly recorded. Subfamily Scarabaeinae is dominant with 57 species under 18 genera, followed by Melolonthinae with 13 species under 05 genera. Third abundant subfamily in terms of species richness is Rutelinae with 10 species under 04 genera. Cetoniinae contributed 09 species under 08 genera. Aphodiinae and Dynastinae contributed 04 and 02 species, respectively, whereas Orphinae added only 02 species. The most dominating subfamily Scarabaeinae can be further categorized into tunnelers, dwellers and rollers according to their functional group. Tunnelers contribute about 77.19% of the species composition of Scarabaeinae followed by rollers 14.04% and dwellers 8.77%. This study also provides the location-specific occurrence data of beetles from the investigated sites. The presented comprehensive checklist is unique in compiling economically and ecologically important scarab faunal diversity of Vidarbha region of Central India.

Keywords Scarabaeoidea · Scarabaeidae · Scarabs · Vidarbha · Dung beetles

Significance statement Considering the economical and ecological importance of scarabs, location-specific species occurrence data of this study prove to be a significant contribution for understanding the diversity and distribution pattern of various species of scarabs.

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Introduction

Insects constitute the largest of all groups in the animal kingdom. Among them, coleopterans typically characterized by a pair of elytra comprise about 40% of all known species of living organisms with approximately 3,60,000 described species [1]. The superfamily, Scarabaeoidea of class Insecta, is a large, diverse and cosmopolitan group of robust-bodied, large-sized beetles. They are frequently brightly colored, and many bear charismatic horns and adornments. They are known as 'dung beetles' due to their coprophagous nature, whereas some are famous as 'rose chafers.' Due to the presence of lamellate antennae, they are also called as 'lamellicorn beetles.'

'White grubs' is the common name applied to the larvae belonging to Scarabaeidae, in particular to those of economic importance to agricultural crops [2]. Grubs of subfamily Melolonthinae, Rutelinae, Cetoniinae and Dynastinae are known to be pests of various agricultural crops such as sugarcane, groundnut and cotton.

Understanding the ecology and documentation of occurrence data of scarabs is of utmost necessity due to their economic and ecological importance. Apart from their economic importance as pests, beetles of the family Scarabaeidae are indicators of environmental change [3]. Activity of beetles positively influences hydrological

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BUTTERFLY DIVERSITY IN RELATION TO A RELATIVE ABUNDANCE AND STATUS IN SELOO CITY, WARDHA MAHARASHTRA, CENTRAL INDIA

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ABSTRACT:-

A survey was conducted to record the butterfly diversity and the status and occurrence of butterfly species in and around Seloo city, Central India from 2011 to 2018. A total of 91 species of butterflies belonging to Papilionidae (07 species), Pieridae (14 species), Nymphalidae (29 species), Lycaenidae (28 species), Hesperiidae (12 species) and 01 species was recorded from the Riodinidae. Of all the total 91 species, 29% were commonly occurring, 46% were very common, 9% were not rare, 13% were rare and 3% were very rarely occurring. About 06 species of the recorded ones come under the protection category of the Indian Wild Life protection Act 1972. The observations support the value of the Seloo city area in providing valuable resources for butterflies.

Keywords: India, Lepidoptera, diversity, Seloo city, Maharashtra

INTRODUCTION

Butterflies are the most beautiful and colourful creatures on the earth and have a great aesthetic value. Butterflies have always been a subject of interest and they are probably next only to birds in their universal popularity evoking curiosity and fondness among children, naturalists and scientist alike. This is partly attributable to the great variety and beauty of their colour patterns and partly to their aromatic transformation during mimicry and migration (Kunte, 2000). They constitute one of the most important links in ecological pyramids of food chain i.e. a link between plants and other predators like birds, reptiles and spiders; transforming and transmitting energy from green plants to the animal. Amongst the invertebrates, butterflies are becoming sufficiently well studied for them to be used for general conservation planning in some parts of the tropics as a representative insect group (Thomas, 1992).

Butterflies are very sensitive biota to environment and are directly affected by changes in the habitats, atmospheric temperature and the weather conditions; they can be good indicators of environment changes (Tiple et al., 2006). Most of the butterflies are seasonal in their occurrence, they are abundant only from beginning of monsoon (June–July) till the early winter (August–November) and decline in species abundance from late winter (December–January) up to the end of summer (Tiple and Khurad 2009).

Butterflies have been studied systematically since the early 18th century and about 19,238 species are documented worldwide by 1998 (Heppner, 1998). This figure is not constant because of the continuous addition of new butterflies and also due to ongoing disagreements between taxonomists over the status of many species.

The Indian subcontinent a diverse terrain, climate and vegetation hosts about 1,504 species of butterflies (Tiple 2011) of which Peninsular India hosts 351, and the Western Ghats 336. In Central India, the butterfly diversity was reported earlier by Forsayeth, (1884); Swinhoe, (1886); Betham, (1890, 1891) & Witt, (1909). D'Abreeu, (1931) documented a total of 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh and Vidarbha). In the recent past, several workers have studied butterflies from urban, rural and protected areas of Vidarbha. 65 species belonging to 52 genera representing 7 families from Pench Tiger Reserve, (Maharashtra) (Sharma & Radhakrishnan, 2005); 68 species of butterflies of 50 genera were recorded from Tadoba Andhari Tiger Reserve (Sharma & Radhakrishnan, 2006) and 103 species of butterflies were recorded from Melghat Tiger Reserve (Wadatkar, 2008). Tiple & Khurad, (2009) reported 145 species of butterflies recorded, of which 62 species were new records

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Butterflies (Lepidoptera Rhopalocera) of the Bor Wildlife Sanctuary, Wardha, Maharashtra, Central India

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ABSTRACT The diversity of butterfly species (Lepidoptera Rhopalocera) was studied in the Bor Wildlife Sanctuary, Wardha district area (Central India) of 138.12 km² from 2011 to 2017. A total of 114 species of butterflies belonging to 6 families were recorded. Most of the butterflies recorded belong to the family Nymphalidae (35 species). 34 Lycaenidae species were recorded. A total of 18 Hesperiidae and 18 Pieridae species were recorded, 8 species were recorded from the Papilionidae and 1 species from the Riodinidae family. Among the 114 butterflies recorded, 9 species come under the protection category of the Indian Wild Life (protection) Act 1972 (i.e., *Pachliopta hector*, *Appias albina*, *Appias libythea*, *Euremа andersonii*, *Euploea core*, *Hypolimnas misippus*, *Enchrysops cnejus*, *Lampides boeticus*, ***Ionolyce helicon***, ***Baoris farri***). The observations support the value of the National Park (Reserve forest) area in providing valuable resources for butterflies.

KEY WORDS Lepidoptera; diversity; Bor wild life Sanctuary; Wardha; Mahrashtra.

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INTRODUCTION

Bor Wildlife Sanctuary was declared as a tiger reserve in July 2014. It is located near Hingani in Wardha District, Maharashtra. It is a home to a variety of wild animals. The reserve covers an area of 138.12 km² (53.33 sq. mile) at 20°57' N and 78°37' E altitude, which includes the drainage basin of the Bor Dam. Bor Wildlife Sanctuary is covered with southern mixed dry deciduous forest. Teak, ain, tendu, and bamboo are the main species of flora in this sanctuary. Tigers, panthers, bisons, blue bulls, chitals, sambars, peacocks, barking deers, chinkara, monkeys, wild boars, bears, and wild dogs are the important faunas of the sanctuary. It represents the floral and faunal wealth of Satpuda-Maikal Landscape. Satpuda runs along the Northern Boundary of Maharashtra from West to East and meets the Maikal Hill range which comes from Kanha (Figs. 1–3).

Among insect, butterflies are the most beautiful and colourful creatures on the earth, have a great aesthetic value and are called the flying jewels or winged jewels of nature. Butterflies are generally regarded as one of the best and most taxonomically studied groups of insects and well observed, not only by the lepidopterists and entomologists, but also by laymen. They are a very common and widespread species, but our understanding on their real biology and diversity may prove to be startlingly below common expectations (Willmott et al., 2001; Ackery, 1987; Tiple & Khurad, 2009).

The butterflies are a very important unit of ecosystem due to the inter-relationship with plants diversity (Kunte, 2000). Their caterpillars can be reared at home and the transformation from cater-

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SHORT COMMUNICATION

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OPEN ACCESS

DESCRIPTION OF LIFE STAGES OF DUNG BEETLE *SCAPTODERA RHADAMISTUS* (FABRICIUS, 1775) (COLEOPTERA: SCARABAEIDAE: SCARABAEINAE) WITH NOTES ON NESTING AND BIOLOGY

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Abstract: Immature stages of *Scaptodera rhadamistus* (Fabricius) are described for the first time along with notes on nidification and biology. The larvae differ from other Scarabaeinae species in the structure of raster on tenth sternum with two irregular bunches of serrations ventrally one on either half. Pupae with pronotum transverse having rounded margins resemble adults, and consist of four lateral, single caudal and single pteronotal support projection. Adult males and females differ in coloration, structure of pronotum, presence of spine like process on mesosternum and, in the structure of male and female genitalia.

Keywords: Description, immatures, nesting, scarab beetle, *Scaptodera rhadamistus*.

Beetles belonging to family Scarabaeidae are commonly called as 'Scarabs' and their larvae are known as white grubs. Arrow (1931) provided detailed account of Indian Scarabaeidae. The monotypic *Scaptodera rhadamistus* (Fabricius, 1775), was previously cited as *Liotongus* (*Paraliotongus*) Reitter under tribe Oniticellini of subfamily Scarabaeinae (Hanski & Cambefort 1991; Philips 2016). Larvae of different stages and adults forage by clearing excrement (Arrow 1931). Adult males of *S. rhadamistus* are attractive owing to the coloration and structure of pronotum.

Much of the literature available relating to scarab beetles are on adult taxonomy. Information regarding their immature forms and nest-building behaviour is deficient (Ritcher 1966; Veeresh 1980; Sreedevi & Tyagi 2014). Studies on natural history of dung beetles of the subfamily Scarabaeinae lack the information on *S. rhadamistus* (Halffter & Matthews 1966). The objective of this study is to present an account of larval morphology and nest-building behavior of *S. rhadamistus*, a commonly found scarab in central Indian region, based on a study conducted in and around Nagpur-Wardha forest areas.

Species diagnosis: In life, adults are yellowish-orange with metallic green colored patches present on dorsal and lateral regions, elongate, oval; 13–15 mm in length and 6–8 mm in width. Males have a prominent pronotum with elevated margins forming deep cavity at

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DIVERSITY, SEASONAL DISTRUBUTION AND STATUS OF BUTTERFLIES IN SATPUDA BOTANICAL GARDEN, NAGPUR, CENTRAL INDIA

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Abstract
A study was conducted to record the butterfly diversity and the status and occurrence of butterfly species in the Satpuda botanical garden within the Nagpur city, Central India, from 2006 to 2019. A total of 96 species of butterflies belonging to Papilionidae (06 species), Pieridae (13 species), Nymphalidae (35 species), Lycaenidae (30 species) and Hesperiidae (12 species) were recorded. Most species were observed from the monsoon (hot/wet season) to early winter (cool/wet season) but thereafter declined in early summer (March). Among the butterflies recorded, 15 species come under the protection category as per the Indian Wild Life Protection Act 1972. The observations support the high value of this city garden for conservation of butterflies and research on their biology.

Keywords: India, Butterflies, Satpuda botanical garden, Nagpur City, Status, Occurrence, Diversity

Introduction

Amongst the invertebrates, butterflies are becoming sufficiently well studied for them to be used for general conservation planning in some parts of the tropics as a representative insect group (Thomas, 1992). Butterflies are most beautiful and colourful creature on the earth and have a great aesthetic value, which make them very attractive. The butterflies are the very important unit of ecosystem due to the inter–relationship with plants diversity. Butterflies are very much important for the pollination as they visit to different flowers for the nectar feeding, which make them important unit of environment. Butterflies are also good indicators of environment changes as they are sensitive and are directly affected by changes in the habitats, atmospheric temperature and the weather conditions (Kunte, 2000; Tiple et al., 2006).

The Indian sub-region hosts about 1,504 species of butterflies (Tiple, 2011) of which Peninsular India hosts 351, and the Western Ghats 334. In Central India, the butterfly diversity was reported earlier by Forsayeth (1884), Swinhoe (1886), Betham (1890, 1891) and Wet (1909) D'Abreeu (1931) documented a total of 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh, Chhattisgarh and Vidarbha). Tiple and Khurad (2009) reported 145 species of butterflies recorded, of which 62 species were new records for Nagpur city.

The present study was started to examine the diversity; population across seasons and habitats of butterflies, since there was no known published checklist of butterflies in the Satpuda botanical garden and hence, the present work was initiated.

Materials and Methods

The findings presented here are based on a field survey and investigation carried on a daily basis from 2006 to 2019 on the Satpuda Botanical Garden, Nagpur. The observations were made from 08.00hr to 11.00hr, which is a peak time for butterfly activity and they were found to do basking.

Identification of Butterfly Species

Identification of the butterflies was primarily made directly in the field. In critical condition specimens were collected only with handheld aerial sweep nets and subsequently released without harm and identification with the help of field guides (Wynter–Blyth, 1957; Kunte, 2000). The observed butterflies were grouped in five categories on the basis of number of sighting in the field. The butterflies were categorized as VC- Very common (> 100 sightings), C- Common (51–100 sightings), NR- Not rare (16–50 sightings), R- Rare (2–15 sightings), VR- Very rare (< 2 sightings) (Tiple et al. 2006; 2007).

Study Area

Nagpur city is the second capital of Maharashtra state and located in the center of India at 20° 9' N and 79° 9' E altitude. It has tropical dry equable climate having three main seasons: June/July wet Monson and its aftermath from June till October, the cool dry winter from October/November to February /March and the hot dry season from April till the onset of rains. Temperature of city ranges from minimum of 12-25°C to maximum 30-45°C with a relative humidity 10-15% to 60-95%. Annual precipitation is 1138.5 mm. Ninety percent of the precipitation takes place within four months, i.e., from June to September, July, being the rainiest month. Satpuda botanical garden is located at west side of Nagpur spreading over 25 ha. Hill and Lake County (Futala)

ODONATA FAUNA IN ADJOINING COASTAL AREAS OF PURBA MEDINIPUR DISTRICT, WEST BENGAL, INDIA

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[Payra, A. & Tiple, A. D. 2019. Odonata fauna in adjoining coastal areas of Purba Medinipur District, West Bengal, India. Munis Entomology & Zoology, 14 (2): 358-367]

ABSTRACT: The Present study was carried out to reveal the odonate diversity in adjoining coastal areas of Purba Medinipur District, West Bengal, India. Study was carried out from January 2014 to January 2018. During the study period a total of 49 species belonging to 35 genera and 7 families were recorded, including addition of 24 species representing 20 genera and 6 families for the district. The maximum number of odonates were found in Libellulidae (n=27), followed by Coenagrionidae (n=12 species), Aeshnidae (n=4 species), Lestidae (n=2 species), Platycnemididae (n=2 species), Gomphidae (n=1 species) and Macromiidae (n=1 species). Among the 4 selected study sites, the highest number of odonate species was observed in S3 (n= 39) and lowest in S1 (n= 21). Out of the 49 Odonates recorded from the district, 48 species come under the IUCN Red List of Threatened Category. Among them 45 species come under Least Concern (LC) Category, three species under Data Deficient (DD) and One species Not evaluated.

KEY WORDS: Dragonfly, Damselfly, Diversity, Coastal area, Purba Medinipur

In biological studies insects occupy a vital position due to their rich diversity and significant role in ecological courses (Hölldobler & Wilson, 1990; Groombridge, 1992). Among the insect's, order Odonata (dragonflies and damselflies) regarded as ideal taxonomic group for the investigation of the environmental health and climate change (Subramanian et al., 2008; Hassall & Thomoson, 2008). Odonates can be found in almost all kinds of freshwater habitats, from permanent running waters, lakes to small temporary rain pools. Their amphibious nature makes them well studied group of insects for assessing environmental changes in both the long term and short-term monitoring (Corbet, 1999). Odonata larvae reside in aquatic habitats, require very specific environmental condition to survive as they have a narrow range for temperature, oxygen levels, vegetation cover, microhabitats and water quality (Clausnitzer et al., 2009). While adult odonates shows high sensitivity with respects to the structure of their terrestrial habitats (Sheldon & Walker, 1998; Orr, 2006). As a consequence, odonates play vital role to bridge multiple trophic levels and act as a major linkage between freshwater and terrestrial food webs (Burkle et al., 2012; Hall et al., 2014).

Globally 6256 species in 686 genera of odonates have been reported, of which India known to represent 487 species, 27 Subspecies in 152 genera under 18 families. (Subramanian & Babu, 2017). Studies on the Odonata fauna of Southern parts of West Bengal were mainly carried out by Selys (1891); Laidlaw (1914); Fraser (1933, 1934, 1936); Ram et al. (1982); Srivastava & Das (1987); Prasad & Ghosh (1988); Mitra (1983, 2002); Srivastava & Sinha (1993); Gupta et al. (1995); Dawn (2014); Jana et al. (2014); Payra & Tiple (2016); Payra et al. (2017); Dwari et al. (2017). However, knowledge on the Odonata fauna of Purba Medinipur District is very fewer. Henceforth, to provide baseline data and to upgrade the

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REVIEW ARTICLE

Metal/Metal Oxide Nanoparticles: Toxicity, Applications, and Future Prospects

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ARTICLE HISTORY

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Abstract: The ever-growing resistance of pathogens to antibiotics and crop disease due to pest has triggered severe health concerns in recent years. Consequently, there is a need of powerful and protective materials for the eradication of diseases. Metal/metal oxide nanoparticles (M/MO NPs) are powerful agents due to their therapeutic effects in microbial infections. In this context, the present review article discusses the toxicity, fate, effects and applications of M/MO NPs. This review starts with an introduction, followed by toxicity aspects, antibacterial and testing methods and mechanism. In addition, discussion on the impact of different M/MO NPs and their characteristics such as size, shape, particle dissolution on their induced toxicity on food and plants, as well as applications in pesticides. Finally, prospective on current and future issues are presented.

Keywords: Metal oxide nanoparticles, toxicity, microbial assay, callus poisoning, pest control, plant biotechnology.

1. INTRODUCTION

Nanotechnology is a revolutionary technique that can resolve major problems faced by humans worldwide [1]. Novel applications of nanotechnology in energy generation, conversion and storage, optics, microelectronics, mechanical, and ceramics engineering are increasing day-by-day. Currently, metal/metal oxide nanoparticles (M/MO NPs) are gaining substantial attention in diverse fields of solid-state chemistry, owing to their unique physico-chemical properties [2, 3]. Nanomaterials (NMs) are being fabricated purposefully using numerous techniques, which exposed to the atmosphere with no safety measurement. Nanotoxicology is the study of NMs' toxicity, which is impacted by the NMs' small particle size, very large surface/volume ratio, as well as their ability to diffuse freely as compared to the bulky particles.

Several approaches, including chemical, thermal, physical and chemical vapored position, precipitation photo-deposition, sputtering, and pulsed electro-deposition, are used for the synthesis of M/MO NPs [4-9]. Various NPs are being already used in commercial applications, including food and agriculture, but they accumulate intracellularly and face difficulty in eliminating from living organisms and because of their toxicity, they could impact the ecosystem [10-13]. Therefore, the present review starts with an analysis of the noxious impacts of NPs on the environment and their contributions to cellular damage. The exposure to NPs through food and its impact are discussed. Applications of M and MO NPs on agriculture are a growing field of research; the effect of different M and MO NPs on plants is analyzed. Further applications of M/MO NPs in pesticides are comprehensively discussed. Finally, conclusions and prospective on applications and impact of M/MO NPs are presented.

2. TOXICITY ASPECTS

M/MO NPs are heterogeneous in nature and their impact on living being rests on their size and shape other than the chemical behaviour of specific metal ion used [11]. Metals having a high dissolution rate are considered highly toxic, while other characteristics such as composition, concentration, morphology, particle dimensions, chemical reactivity, agglomeration, and dispersal directly affect their behaviour and interactions with surroundings [8]. Moreover, NPs liberated ionic species is among the main sponsors to noxiousness.

Moreover, surface charges dictate the interactions between NPs and cellular components. Aggregation helps particles to bond *via* the weak interactive forces and they are predominantly reliant on the charge, concentration and ingredients of the nearby environment. Agglomeration disturbs the bio-distribution plus interactions of NPs, when exposed to the cells. Agglomeration can be analysed by means of laser diffraction technique by measuring the *Brownian motion* in suspension and applying the *Stokes-Einstein* equation [12, 13]. The surface area and chemical composition of NPs are measured by *Brunauer-Emmett-Teller* (BET) adsorption-desorption behaviour under nitrogen. As the particle size declines, the relative surface area per unit mass inclines and as a consequence, the fraction of active atoms, those on the surface, increases, which can enhance toxic reactions [14]. Stable accumulation of NPs can remain energetic for a long time in the body. However, degradable NPs cause severe effects by releasing reactive oxygen species (ROS).

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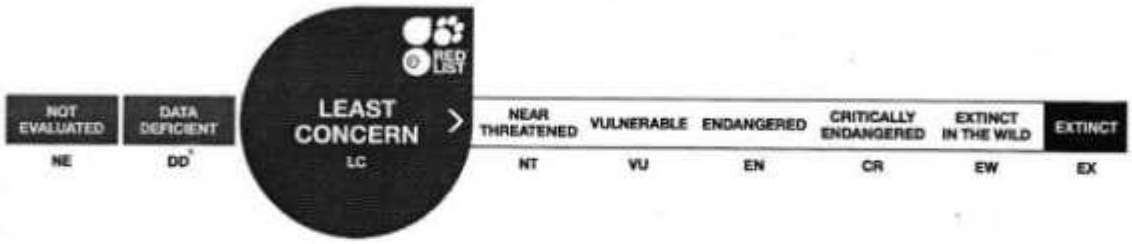
The IUCN Red List of Threatened Species™
ISSN 2307-8235 (online)
IUCN 2019: T121971639A122602131
Scope: Global
Language: English

Pachliopta aristolochiae, Common Rose

Assessment by: Rushbrooke, M. *et al.*



View on www.iucnredlist.org

Short citation: Rushbrooke, M. *et al.* 2019. *Pachliopta aristolochiae*. The IUCN Red List of Threatened Species 2019: e.T121971639A122602131. http://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T121971639A122602131.en [see full citation at end]

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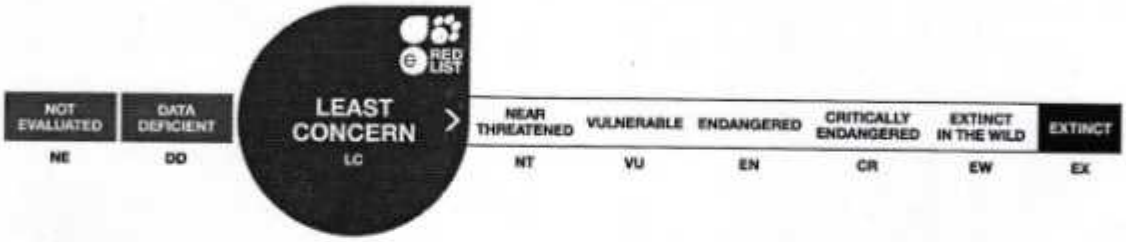
Language: English

Pachliopta hector, Crimson Rose

Assessment by: Fernando, E., Jangid, A.K., Alwis, C., Chowdhury, S., Jayasinghe, H.D., Kehimar, I., Kunte, K., Rajapakshe, S.S. & Tiple, A.D.



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Citation: Fernando, E., Jangid, A.K., Alwis, C., Chowdhury, S., Jayasinghe, H.D., Kehimar, I., Kunte, K., Rajapakshe, S.S. & Tiple, A.D. 2019. *Pachliopta hector*. The IUCN Red List of Threatened Species 2019: e.T121972074A122602161. http://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T121972074A122602161.en

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The IUCN Red List of Threatened Species™
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Language: English

Pachliopta pandiyana, Malabar Rose

Assessment by: Fernando, E., Jangid, A.K., Kehimar, I., Kunte, K., Moonen, J. & Tiple, A.D.

View on www.iucnredlist.org

Citation: Fernando, E., Jangid, A.K., Kehimar, I., Kunte, K., Moonen, J. & Tiple, A.D. 2019. *Pachliopta pandiyana*. The IUCN Red List of Threatened Species 2019: e.T121973590A122602241. http://dx.doi.org/10.2305/IUCN.UK.2019-3.RLTS.T121973590A122602241.en

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Synthesis, Characterization & Antimicrobial Studies of Platinum (II), Palladium (II) And Fe (II) Complexes with Newly Synthesised Ligand p- Phenyl Isonitroso Acetophenone

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BSTRACT:

e Pt(II) , Pd(II) and Fe(II) complexes of newly synthesised ligand p-Phenyl isonitrosoacetophenone PhINAP) have been synthesized . The complexes of formula Pt(p-PhINAP)$_2$, Pt(p-PhINAP)$_2$ & p-PhINAP)$_2$ were investigated by element microanalysis for C,N,H,M. Infrared Spectra (IR), Proton clear Magnetic Resonance Spectra (HNMR) and Magnetic properties. Based on spectral data, nplexes appear octahedral geometry. The antimicrobial activity of the complexes against the crobes were higher than that of ligand p-Phenyl isonitrosoacetophenone .

y word: Pt(p-PhINAP)$_2$, Pd(p-PhINAP)$_2$,Fe(p-PhINAP)$_2$, octahedral geometry, HNMR and antimicrobial ivity.

roduction :

Coordination chemistry is undoubtedly the most active research area in inorganic chemistry. Several rdination complexes have been synthesized and investigated during the past few decades. Ever since the portance of coordination phenomenon in biological processes was realized, lot of metal containing cromolecules have been synthesized and studied to realize the role of these ligands in biological systems, they also contribute to the development of new metal-based chemotherapeutic agents. Transition metal nplexes of oxime have been the most widely studied co-ordination compound in the past few years due to r unusual magnetic properties, novel structural feature and relevance to biological system[1-3]. With nificant development in the field of biological activity of metal chelates plays vital role in the causes and tment of Cancer[4,5]. The ligand p-bromoisonitrosoacetophenone (p-BrINAP) and p-roisonitrosoacetophenone (P-ClINAP) have also been studied for few transition metals[6,7].

vever, structural studies of the complexes of transition metals with p-phenyl isonitroso acetophenone have been reported so far. The present paper describes the synthesis and characterization of complexes of sition metals Pt(II), Pd(II) & Fe (II) with p-phenyl isonitroso acetophenone on the basis of elemental ysis, IR Spectra, NMR Spectra, Magnetic properties and Antimicrobial activity.

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Synthesis of 2-Aryl-3-[4/-Phenyl hiazolidinyl]-4-Oxo-Thiazolidines

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Abstract

2-amino4-substituted phenyl thiazole **(1a-i)**, 2-imine substituted phenyl-4-substituted phenyl thiazole **(2a-i)** 2-(4,-oxo-2,-bstituted aryl-Thiazolidinyl)-4/substituted phenyl thiazole. **(3a-i)** were prepared by the reaction of thiourea with different acetophone with excellent yield. Elemental analysis, IR, H1NMR, C13NMR & Mass spectral data established identification of the compounds **(3a-i)** was evaluated for their antimicrobial and antifungal activity.

Keywords: *4-oxo-thiazolidines, thioglycolic acid, spectral data, antibacterial activity, etc.*

INTRODUCTION

Heterocyclic compounds have played an important role in the evolution of life, as dyes, drugs and are also used in many commercially important species and their analogs in which one or more ring carbons have been replaced by a heteroatom, such as nitrogen, oxygen, sulfur, phosphorus, silicon, a metal and so on. The most-common heterocyclic systems contain nitrogen or oxygen or both. 4-Thiazolidinones are derivatives or Thiazolidine with a carbonyl group at the 4-position substitution is possible at 2,3 and 5-position.[1-2] The nucleus is also known as wonder nucleus because it gives out different derivatives with all different types of biological activities and therefore thiazolidinone with varied substituent are being synthesized and as better medicinal agent in recent years 4-oxo-thiazolidine are the most extensively investigated class of compounds, which exhibit various biological activities antimicrobial, anti-inflammatory, anti HIV, antitubercular, antioxidant and analgesic.[3-8] 4-Thiazolidinones nucleus has occupied unique place in the field of pharmaceutical activities like antibacterial, anticancer, antiviral, cardiovascular, antitumor, CNS depressant.

RESULT AND DISCUSSION

In view of these observations, it was thought worthwhile to synthesize several compounds in which 2-amino, 4-subsituted phenyl thiazole, 2-substituted phenyl imine 4-substituted phenyl thiazole, 2-substituted aryl, 3-substituted phenyl thiazole, 4-thiazolidinones have been linked with moiety.

The reaction sequence leading to the formation of desired heterocyclic compounds are outlined in **scheme-1**.The starting material 2-amino, 4-substituted phenyl thiazole **(1a-i)** was prepared by the reaction of substituted acetophenone with thiazole in presence of Br2 –H2o and ethanol. Synthesis of 2-amine substituted phenyl 4-substituted phenyl thiazole **(2a-i)** the substituted 2-[4-oxo-2-substituted aryl-Thiazolidinyl] 4-substituted phenyl thiazole **(3a-i)** by the reaction of 2-amine substituted phenyl, 4-substituted phenyl thiazole with thioglycolic acid and zinc chloride in presence of benzene the IR, H1 NMR,C13NMR, Mass spectra of the 2-substituted aryl-3substituted phenyl thiazole 4-thiazoldinones.

Biological Studies

Biological Study of thiourea with different acetophenones and **(3a-i)** has been observed by using Norfloxacine and Griseofulvaline as standards. The enhancement in biological activity of compound (1) as compared with the newly synthesized **(3a-i)** has been observed. The synthesized compounds were tested at 100ml concentration against staphylococcus aureus, E-coli, P. vulgaris, A. niger, B. substillis, C. albicans for its antibacterial and antifungal screening as shown in **Table-I.**

7. Progression Development of Family Business: The Entrepreneurial Perspectives in India

Prof. Dr. Parag R. Kawley
Assistant Professor, Vidyabharti College, Seloo, Ta. Seloo, Dist. Wardha.

Abstract

Family businesses are an vital group of enterprises not simply inside the small and medium-sized division although too many of the world's huge enterprises are in family businesses. Although family businesses account for more than 90% of businesses in India, however there is scarcity of awareness about their ways of organizing and managing business in these speedily changing times. Some studies approximate that only 40 percent of family enterprises carry on to the second generation. Family firms must have a long-term vision in administration their business. Progression development refers to the purposeful and formal progression that facilitates the express of ownership and management control. In adding together to raising consciousness, explicit consultancy, and mentoring that facilitates the transfer process, marketplaces that afford a proposal for bringing simultaneously probable buyers and sellers are a significant implement for development successful business transfers. Suitable financial goals of both the business and the family require to be ascertained and equilibrium between the two sets of objectives has to be achieved. The study is totally based on the secondary data; the practices measured contain to be national, the study has been of the experiences of the Small and Medium Enterprises.

Key Words: Progression Development Of Family Business, Transfer of Management, Ownership and Marketplace for the Business, Indian Scenario.

Introduction

Family businesses are an vital group of enterprises not simply inside the small and medium-sized division although too many of the world's huge enterprises are in family businesses. Despite a few statistics feed sufficient to map the occurrence of family businesses throughout the world, many studies conducted in different countries have definite the weight these businesses take in national economies. In the past, family businesses were regularly alleged to be the weakest type of enterprises; if they were unbeaten, it would be accomplished that such success was ascribed to their family character.

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Although family businesses account for more than 90% of businesses in India, however there is scarcity of awareness about their ways of organizing and managing business in these speedily changing times. Some studies approximate that only 40 percent of family enterprises carry on to the second generation because of uncertain or deficiently solved alteration of possession and management to the next family generation and many enterprises not succeed presently after the second generation takes manage. Failure in progression represents a serious difficulty not only for family enterprises and their workers, but also for the success of an economy. Intergenerational progression represents a vital point in the lifecycle of any family business and, as such, has been a primary focus of investigate.

Family firms must have a long-term vision in administration their business. Unfortunate progression development leads to suspicions in future, family conflicts for manage and difficult impact on business presentation. Hence, family firms must take all contingencies into explanation and analytically plan for the development of second line of authority that is, the next generation of the owning family. Accurate training and timely grooming of the younger generation provide the successors to successfully expulsion their duties in future. Systematic amalgamation of family members in the business helps sustain the thread of stability in business leadership. For the plan to work efficiently, it is imperative that successors must be provided timely inputs associated to the goals, opportunity and obligations of their positions. Well-documented progression plan ought to be evolved that obviously outlines the roles and responsibilities of all following family members. The younger generation must be aggrivated and supported to take up leadership role in future. Main goal of contribution is to widen our sympathetic of family businesses progression issues & probable solutions, with special focus on progression development & sustaining infrastructure wanted in order to bring out transfer of ownership and management effectively.

Objectives of the Study

1. To find out the entrepreneurial perspectives survive in the consecutive development of the business in India.
2. Whether exists any impact on the part of the obtainable enterprise due to the consecutive development or not;
3. To draw consideration towards the necessary changes for embracing in the case of the consecutive development of entrepreneurial management.

Limitations of the Study

1. The study is totally based on the secondary data;
2. The practices measured contain to be national;

ROLE OF E-COMMERCE & IMPROVEMENT OF MARKET DEVELOPMENT IN INDIA

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ABSTRACT

E-commerce is the most essential application of the new communication technology. The E-commerce has invaded the businesses in many ways. E-commerce has extremely compact the transaction costs related with purchase, sales, in commission, holding catalog and financial cost. New trends in IT facilitate this progression and point out the energetic future improvement of this new approach of doing business.

KEYWORDS: E-commerce, Benefits of E-Commerce, Improvement of Market Development, B2B, ERP.

INTRODUCTION

The appearance of the Internet during the world has been causative such a variety medium in doing business as well as people existence. In fact, Internet is the necessary requirement for the subsistence of E- commerce. Electronic commerce has been defined as the aptitude to execute communication connecting the replace of goods or services between two or more parties using electronic gear and techniques. The explosion of E-commerce has formed new phenomena in our lifestyle particularly in shopping activities. Consumers can simply buy products or services like magazines and airlines tickets via Internet.

E-commerce is the most vital application of the new communication technology. Manufacturers, traders and consumers can now achieve the market more rapidly and get more information than they could ever before. The application of e-commerce during progress of web site enhances the probable global market and sales revenue, product, probable new customers, services and geographical areas. In term of non-financial reimbursement, e-commerce has extensively helped improving human resources and suitability, quality of services, customers' fulfillment and some other circuitous effects.

The essential of electronic commerce depends on the appraisal and assessment. To evaluate related data on e-commerce is essential, while it is not readily available. The available data are together by different agencies by numerous definitions and methodologies used by the collecting group. In the deficiency of consistent data, policy makers, governing bodies and business communities are not capable to take decisions that replicate the changes brought about by the e-commerce. By employing important and ideal data on e-commerce, the policy makers and researchers would be able significantly analyze the impact of e-commerce on labor market, market structures and implementation, changes in allocation of goods and services, customers preferences changes in global contest. It permits them to take well framed decisions about the policies and investments in e-commerce associated segment.

OBJECTIVES OF THE STUDY

1. To learning The benefits of E-Commerce.
2. To learning a variety of Models in the E-Governance.

3. To learning The Market improvement Of B2B E-Commerce.

BENEFITS OF E-COMMERCE

A. Transaction costs :-

Three cost areas are extensively compact during the conduct of B2B e-commerce.

1. First is the decrease of exploration costs, as buyers require not go during multiple intermediaries to explore for information regarding suppliers, products and prices as in a usual supply chain? In conditions of exertion, time and money spend; the Internet is a more capable information channel than its conventional corresponding item.

2. Second is the decrease in the costs of processing transactions (e.g. invoices, purchase orders and payment schemes), as B2B allows for the computerization of operation processes and hence, the quick completion of the same compared to further channels (like the telephone and fax). Effectiveness in trading processes and dealings is also improved during the B2B e-market's skill to process sales during online auctions.

3. Third, online giving out improves inventory management and logistics.

B. Disintermediation :-

During B2B e-markets, suppliers are capable to relate and conduct openly with buyers, so eliminating intermediaries and distributors. Though, new forms of intermediaries are rising. For example, e-markets themselves preserve considered as intermediaries because they approach between suppliers and customers in the provide chain.

C. Transparency in pricing :-

Amongst the further apparent reimbursement of e-markets is the increase in price intelligibility. The assembly of a huge number of buyers and sellers in a single e-market reveals market price information and operation processing to participants. The Internet allows for the publication of information on a single acquire or transaction, creation the information willingly nearby and obtainable to all members of the e-market. Enlarged price intelligibility has the outcome of pulling down price differentials in the market. In this circumstance, buyers are provided a lot more time to evaluate prices and make better buying decisions.

MARKET DEVELOPMENT OF B2B E-COMMERCE

In latest years due to speedily rising e-technologies and growing the internet saturation, businesses became attentive of the likely role of the Internet as an influential source of aggressive improvement. New trends in IT facilitate this process and point out the energetic future development of this new approach of doing business. The trends in IT that influence B2B e-commerce are the following:

- The increase of the internet security and comfort intensity of online payments.
- Cloud computer and software-as-a-service (Saas)
- development of collaborative B2B e-commerce applications
- incorporation of enterprise resource planning systems (ERP).

These main trends exhibit that the performance and the exploitation of B2B e-commerce is getting less costly, provides more security and enables the easiness of use for the end-users. All these technical improvement and advances protected the future expansion of B2B e-commerce. B2B e-commerce has been rapidly rising all over the world, as it is measured to be a medium to improve business effectiveness. The use of the Internet has a dramatic contact on both buyers and sellers as well as on the entire network of information, goods and financial flows.

THE VARIOUS MODELS IN THE E-GOVERNANCE SCENARIO ARE

a) Government-to-Government (G2G) model: These models involve transactions between governments. For example, if the Indian government wants to by oil from the Arabian government, the transactions concerned are cat-

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Reading of Vikas Swarup's The Accidental Apprentice in the light of Socio-Cultural Problems in India

Mr. Vaibhao B. Pimpale, Dr. Hitendra B. Dhote

Abstract

In modern scholarly writers think about, a subject is the central theme of content treats. The foremost common understanding of the subject is an idea or point that's central to a story. Acclaimed author Vikas Swarup implies the new narrative techniques of the seven tests to throw light on some of Indias uncommon social and contemporary problems, whereas never losing locate of the character at the center of the story. The story interwoven around a shop assistant, Sapna Sinha, who is offered to become CEO of a big company in the event that she can pass an arrangement of seven tests. The theme of struggle of existence is the central feature of the thematic concerns in the novel. Also, Swarup emphasizes on many other arguable issues pertaining to the post modern Indian society through his novel, The Accidental Apprentice. It is obvious that Swarups critical thematic plea, his strong stresses on the complexities of the human nature and his fantastic delineation, seem to have added massively to the achievement of this novel, thus signifying his brilliance as one of the prominent writers of post modern India.

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A Study of Personnel Selling & Sales Management A Connection Marketing Outlook

Prof. Dr. Parag R. Kawley
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Abstract

Personal selling and sales management is change as an outcome of the enlarged concern on venerable, customer and seller communication and identifies various implications of these changes. Changes in predictable individual selling and sales management behavior are preferred to sustain the look of the partnering role for salespeople. For salespeople in the partnering role, the personal selling shifts from a focus on influencing buyer behavior to control the inconsistency intrinsic in buyer-seller relationships. The significance on structure associations rather than making short-term sales and the use of sales teams dictates changes in the way firms select, train, evaluate, and balance salespeople and members of sales teams; I want to propose some issues regarding the emerging partnering role for salespeople that justify the consideration of in personal selling and sales management.

Keywords: Personal Selling, Salesperson, Sales Management, Customer, Marketing.

Introduction

The salesperson plays a key role in providing the customer with information about such goods to decrease the risks concerned in the purchase and utilize. Insurance, for example, is an intricate and practical product that regularly needs considerable amounts of personal selling.

It is essential to consider that for many companies the salesperson represents the customer's main link to the firm. The salesperson is the company. Therefore the company must take advantage of this unique link. Through the efforts of a successful salesperson, a company can build relationships with customers that continue long. Personal selling is an integral of the marketing system, fulfilling two vital duties: one for customers and one for companies. Lacking relevant information, customers are likely to make poor buying

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Report on the 10th South Asian Dragonfly Meeting and Symposium 2018

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The 10th South Asian Dragonfly Meet and Symposium 2018 was organized by Hislop College, in association with South Asian Council of Odonatology, DragonflySouthAsia, and Maharashtra State Forest Department (Melghat Tiger Conservation Foundation) from 3 to 6 October 2018 at Hislop College, Nagpur, India, including a three-day workshop at Melghat Tiger Reserve (Semadoh), Amravati, India. Mr Nitin Kakodkar, Additional Principal Chief Conservator of Forest (Maharashtra State), was the chief guest of the inaugural function which was presided over by Prof. D. B. Tembhare, past President, South Asian Council of Odonatology and ex-head, PGD Zoology, RTM Nagpur University. The dais was shared by the Principal of Hislop College, Dr Dipti Christian and Conveners of the Symposium, Dr K. A. Subramanian (Zoological Survey of India, Chennai) and Dr R. J. Andrew. The welcome address was followed by the release of the souvenir (in CD format). Dr R.J. Andrew, President, South Asian Council of Odonatology, and Convener of the Symposium spoke about various symposia and conferences of Odonatology organized by the South Asian Council of Odonatology held at different places in India, including the fifth, seventh and eighth at Nagpur under his leadership and also the 18th International Symposium of Odonatology which was organized by Hislop College in 2008. Dr Dipti Christian, Principal of Hislop College, lauded the efforts taken by the Department of Zoology in organizing such academic activities. She focused on the need for conservation of biodiversity and habitats. The chief guest Mr Nitin Kakodkar spoke about the similarity between tiger and dragonfly in its own biotope. He further added that the potential of the odonates is yet to be understood as they have a definite role to play in maintaining ecology in a given ecosystem, and the biodiversity to be protected. Prof. D. B. Tembhare was felicitated for his forty years of research in odonatology and being the perfect role-model teacher for his students. He informed delegates about the work undertaken by the South Asian Council of Odonatology, and the role undertaken by Hislop College in organizing various programs for the council. During the vote of thanks, Dr Andrew felicitated the persons who have helped him in organizing various odonatology symposia for the last 25 years. The list included Dr Manu Thomas (Madras Christian College, Tambaram, Chennai), Dr Gurinder Kaur Walia (Punjabi University, Patiala), Dr D.D. Barsagade, Dr S.S. Bakare, Dr S.S. Shrikhande, Dr Avinash Upadhyay, Dr Ashish Tiple, Dr Deepa Jamwal and Dr Anjali Andrew. The whole-hearted cooperation rendered by Mr M. Srinivasa Reddy, Chief Conservator of Forest and Field Director, Melghat Tiger Project, Amravati in the organization of the workshop at Semadoh, was appreciated and acknowledged.

After the address of the guests, the first session started with the Keynote address by Dr K. A. Subramanian (Odonata of the Himalayan region), followed by a plenary talk on dragonflies of Kerala by Mr Balachandran V. (General Secretary, Indian Dragonfly Society). In the second session, Mr David Raju (naturalist and author) presented a talk on the Biodiversity of Central India followed by an academic presentation by Dr Anulin Christudhas on *in silico* analysis of dragonfly defensin for its antibacterial activity. Post-lunch the participants departed for Melghat for the workshop session which was arranged at the Semadoh area of Melghat forest (21.4458 N, 77.1972 E, 564 m asl). The idea of the workshop was to provide a platform for researchers and amateurs working on odonates across India, to conduct field surveys, and to meet, interact and discuss their work. As soon as the participants reached Semadoh, Dr Ashish Tiple (Head, Dept. of Zoology, Vidhyabharati College, Selu) briefed them on the workshop schedule, activities to be undertaken and the general agenda of the workshop.

On 4th October morning, a field trip was arranged to Sipana River and Jawahar Kund waterfall in Melghat Tiger Reserve. The trip was led by Dr Ashish Tiple, Dr Gaurav Sharma (Zoological Survey of India, Solan) and Mr Shantanu Joshi (National Centre for Biological Sciences, Bangalore). Nineteen species of odonates were sighted during the trip. The field trip was followed by talks on understanding Odonata and Odonata behavioral biology by Neha Majumdar (Bombay Natural History Society, Mumbai), followed by a presentation on the taxonomy of Odonata by Mr Amila Sumanapala (Butterfly Conservation Society of Sri Lanka). Both these audio-visual lectures provided participants with basic knowledge on the identification of common odonates of the region. This session was followed by student participant presentations.

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Original Article

An Updated List of Odonata Species from Athgarh Forest Division, Odisha, Eastern India (Insecta: Odonata)

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Abstract

Altogether 72 species of Odonata belonging to 46 genera and 9 families were recorded from Athgarh Forest Division, of which 32 species are representatives of the suborder Zygoptera and 40 species are members of the suborder Anisoptera. Athgarh Forest Division represents 65.4 % of the Odisha state and 14.7 % of the Indian Odonata fauna. Among recorded species, 17 species are newly recorded for Athgarh Forest Division. *Elattoneura nigerrima* Laidlaw, 1917 is reported for the first time from the state, and occurrence of *Indothemis carnatica* (Fabricius, 1798) in Odisha is confirmed here for the first time. *Pseudagrion spencei* Fraser, 1922 is also added to the Odonata fauna of Odisha and reported for the second time in the state from Athgarh Forest Division.

Key words: Odonata, distributional records, habitat, Odisha state, India
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Introduction

The Odonata (damselflies and dragonflies) is one of the oldest insect orders with origin spanning back to the Carboniferous era, about 250 million years ago. They probably mark the first time that evolution experimented with the ability to hover in the air over an object of interest (Subramanian, 2005; Andrew *et al.*, 2008). They are beautifully coloured insects; spend their major part of their life cycle in freshwater ecosystems, such as rivers, streams, lakes, marshes, rice fields and known as the quintessence of freshwater health. They are not only important for water-rich habitats such as wetlands, lakes, and rainforests, but also significant for habitats where water is scarce, and therefore order Odonata regarded as a flagship group of insects (Dijkstra, 2007).

Worldwide, 6256 species in 686 genera of odonates have been reported, of which India known to represent 488 species, 27 subspecies in 152 genera under 18 families (Subramanian & Babu, 2017). Some of the noticeable works on Odonata fauna of Odisha were carried out by Laidlaw (1915), Fraser and Dover (1922), Srivastava and Das (1987), Prasad and Ghosh (1988), Mitra (2000, 2002), Sethy and Siddiqui (2007), Das *et al.* (2010, 2012), Nair (2011), Debata *et al.* (2013), Sajan and Mohapatra (2013), Kalita *et al.* (2014), Nair and Subramanian (2014), Payra *et al.* (2014, 2019),

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SHORT COMMUNICATION

Butterfly (Lepidoptera: Rhopalocera) fauna of Jabalpur City, Madhya Pradesh, India

Jagat S. Flora [1], Ashish D. Tiple [2], Ashok Sengupta [3] & Sonali V. Padwad [4]

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Abstract: The present study was carried out to reveal the butterfly species diversity in the Jabalpur City, Madhya Pradesh, India. Study was carried out from January 2008 to 2018. A total of 112 species were recorded, with an addition of 41 new species for Jabalpur district and one species for the state of Madhya Pradesh. Of the total, 42 species were very common, five were frequent common, 18 were rare, and four were very rare. Nymphalidae was dominant with 39 species, followed by Lycaenidae with 38, Pieridae with 15 species, Hesperiidae with 14, Papilionidae with eight and Riodinidae with one species. About six species of the recorded ones come under the protection category of the Indian Wildlife (Protection) Act, 1972. The study illustrated the value of Jabalpur City area in hosting valuable resources for butterflies.

Keywords: Butterflies, central India, diversity, new records.

Among insects, butterflies are sensitive biota severely affected by the environmental variations and changes in the forest structure as they are closely dependent on plants (Pollard 1991). Butterflies are generally regarded as one of the best taxonomically studied groups of insects; they have been studied systematically since the early 18th century and about 18,000 species are documented worldwide (Martinez et al. 2003). This figure is not constant because of the continuous addition of new butterflies and also due to ongoing disagreements between taxonomists over the status of many species.

The Indian subcontinent with a diverse terrain, climate, and vegetation hosts about 1,504 species of butterflies (Tiple 2011) of which peninsular India hosts 351, and the Western Ghats 336. Butterflies enable sustenance of ecosystem services through their role in pollination and serving as important food chain components. Being potential pollinating agents of their nectar plants as well as indicators of the health and quality of their host plants (Tiple et al. 2006) and the ecosystem as a whole, exploration of butterfly fauna thus becomes important in identifying and preserving potential habitats under threat.

In central India the butterfly species diversity was reported earlier by Forsayeth (1884), Swinhoe (1886), Betham (1890, 1891), Witt (1909), and D'Abreu (1931) who documented a total 177 species occurring in the erstwhile Central Provinces (now Madhya Pradesh and Vidarbha). Subsequent monumental works and fauna volumes include several species from Madhya Pradesh and Chhattisgarh (Evans 1932; Talbot 1939, 1947; Wynter-Blyth 1957). In the recent past, several

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TRAVAUX DU MUSÉUM NATIONAL D'HISTOIRE NATURELLE "GRIGORE ANTIPA"
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Travaux du Muséum National d'Histoire Naturelle "Grigore Antipa" 63 (2): 131–140 (2020)
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RESEARCH ARTICLE

Dragonflies and Damselflies (Odonata: Insecta) of the Bor Wildlife Sanctuary, Wardha, Maharashtra, Central India

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Abstract

Dragonfly and damselfly (Odonata) species diversity was studied in the Bor wildlife sanctuary from 2011 to 2018. A total of 72 species of odonates belonging to 8 families were recorded. The study adds three new species for the Vidarbha region. The highest number of odonates belonged to the family Libellulidae (31 species) followed by Coenagrionidae (15 species), and Aeshnidae (six species). Of the total, 30 species were very common, 18 were common, seven were frequent common, 11 rare and six very rare. Among all, six species were Data Deficient, *Indothemis carnatica* (Fabricius, 1798) is listed as Near Threatened and 64 were Least Concern, in IUCN red-list of threatened species. The observations support the value of the wildlife sanctuary area in providing valuable resources for Odonata.

Keywords

Odonata, diversity, Bor Wildlife Sanctuary, Wardha, Mahrashtra, India

Introduction

Odonata (damselflies and dragonflies) is one of the oldest and amphibious insect order, with origins spanning back to Carboniferous era, about 250 million years ago. Dragonflies are very interesting and diverse insects. Odonates are freshwater insects and play an important role in wetland and terrestrial food chains as predators. The adults are generally predacious, while the larvae are carnivorous and voracious feed-

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SHORT COMMUNICATION

First Record of *Epophthalmia frontalis* from Central India (Insecta: Odonata: Macromiidae)

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Abstract

Epophthalmia frontalis, a new Macromiidae dragonfly for Central India, is recorded from Seoni of Madhya Pradesh based on a collection of a single male. In India, earlier, this species was only known from a few places of Western Ghats and Eastern India. Diagnostic characters with closely resemble species and field photographs are given.

Keywords

New Record, *Epophthalmia*, Madhya Pradesh

In the Indian fauna, family Macromiidae Needham, 1903 has 17 species represented by only two genera i.e. *Epophthalmia* Burmeister, 1839 and *Macromia* Rambur, 1842. Genus *Epophthalmia* was first proposed by Burmeister in his well know volume "Handbuch der Entomologie" in 1839 (Lieftinck 1931), with the type species *Epophthalmia vittata*. At present, genus *Epophthalmia* consists of six described species and confined only in the Asian countries (Schorr and Paulson 2020). In India, genus *Epophthalmia* is represented by three species (Subramanian and Babu 2017). *Epophthalmia vittata* Burmeister, 1839 is a frequently reported species in India and recorded from Andaman and Nicobar Islands, Andhra Pradesh, Goa, Jharkhand, Chhattisgarh, Kerala, Maharashtra, Odisha, Uttarakhand, Tamil Nadu, Tripura,

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RESEARCH ARTICLE OPEN ACCESS

Shoot induction and daidzein production in *Desmodium gangeticum* (L.) DC by using different Concentrations of Kinetin

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Abstract

Nodal explants were inoculated with basal cut surface down on MS medium with Kinetin. The different concentrations of Kinetin ranging from 0.25, 0.5, 0.75 and 1mg/lit were used for obtaining multiple shoots. After 40 days, maximum number of multiple shoots were obtained on medium containing 0.5mg/lit of Kinetin which was approximately 34.28±0.1 per culture. In the present study, 0.5mg/lit of Kinetin concentration was found to be an ideal concentration for high frequency of multiple shoots induction. This is the first report of such high frequency of multiple shoot induction in *D. gangeticum*. Maximum daidzein 7.991±0.02µg/g D.W. content was found at 0.25mg/lit kinetin. Minimum daidzein content was found at 1mg/lit Kinetin (5.504±0.02µg/g D.W.). We found that, the difference in the content of daidzein was also affected by concentration of Kinetin i.e. increased the concentration of Kinetin up to 0.5mg/lit, increased number of multiple shoots but decreasing concentration of daidzein.

Keywords: Kinetin, daidzein, multiple shoot, *Desmodium gangeticum*.

Introduction

Desmodium gangeticum (L.) DC belongs to family Fabaceae (Leguminoceae). It is known as Salparni in Sanskrit. It is a sub-erect, under-shrub 0.6–1.2m high with irregular angled, branched woody stem. Leaves are unifoliate or trifoliate. Flowers are small, pink to purple in color [1]. It is found in India, China, Africa, Australia, Geylon, Burma, Malay Peninsula, Islands, Philippines and Tropical Africa [2, 3, 4].

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Some floristic diversity in Vidyabharti College Campus, Seloo, dist. Wardha (Maharashtra) India

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ABSTRACT: The present study was carried out to assess floristic diversity to collect the information and number of plant species in college campus. Up to this date, the progress is relatively slow, as the number of common names, synonyms is high in studied area. One of the grand tasks of current taxonomy is to prepare a checklist of plants of the globe. For this purpose critically examined data are required in regional floras and checklists with all the taxonomic tools. Certain areas mostly the rural areas remain poorly explored as the majority of novelties come from the tropics and numerous species in these areas still waiting to get recognition. Taking into consideration the importance of taxonomy, I have selected to study the floristic diversity of Vidyabharti Mahavidyalaya campus area Seloo of Wardha District with special reference to the number of individual species in the area. The Seloo is situated at 20°50'6"N and 78°42'33"E. In 2011, the Town population was nearer 40,000. The present study attempts to understand and highlight the rainy season floristic diversity of vast plant resources of the campus in a conservation perspective. A total of 80 species of flowering plants are documented in which 44 were herbs, 20 shrubs and 16 trees distributed in 25, 15, and 12 families respectively.

Keywords: *Floristic Diversity, taxonomy, survey*

INTRODUCTION

Floristic explorations and the taxonomic study provides resourceful and opportune information about the distribution, nomenclature, ecology, utility of diversities in plant species and thus consequently about an ecosystem. From the very beginning of inception of human beings on the earth man has relied on plants to fulfill his basic needs for his survival. Plants provide food, shelter and health. India is one among the 12 mega-biodiversity centers identified in the world having rich biodiversity indices, vast flora and fauna coupled with different topographical, ecological, climatic factors and about 18,664 taxa of vascular plants with 5725 endemics (Nayar, 1997). It is estimated that about ten million species of plants inhabit the planet earth. Out of that only 1.7 million species are known to science. Therefore, it is a strong need to study and explore the floristic wealth. However the plant diversity is under serious threat due to various anthropogenic activities and several species are disappearing and most of the species are awaiting to study. Various species are becoming extinct. Such a scenario indicated that, there is an urgent need of conservation of floristic diversity. To originate diverse strategies, the first important step is to explore and make inventories the flora of selected areas. Keeping this point in view, the present studies were initiated to explore and make inventories the plant species.

Therefore, an attempt has been made to study the plant species present in the Vidyabharti College Campus area. Different Morphological (external) characters are being studied like habit, height, stem, leaf, flowers, inflorescence and fruits etc representing diversity of plants in the college campus.

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FOOD SECURITY IN MAHARASTRA: REGIONAL DISPARITIES

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ABSTRACT

Regional disparities all along with food security have remained an issue of debate in Maharashtra yet while its commencement as a State in 1960. Some studies have examined economic development as well as food security issues at the regional level, although there has been no efficient effort made to analyze food security systematically pleasing into account its four elements viz. accessibility, convenience, sustainability, and consumption. The circular argument that disparities in investment lead to underdevelopment and accordingly food uncertainty is a part of our well-built dispute. Therefore, an effort is made in this paper to comprehend food security across regions of Maharashtra. The results make known three major groups of regions in terms of food insecurity. Whereas certain regions practice food arrears and lower poverty alongside a higher level of nutritional status, the other regions reveal higher levels of under-nutrition and poverty along with comparatively higher and medium food competence.

Key Words: Food Security, Nutrition Security, Region, Maharashtra in India.

INTRODUCTION

Maharashtra has not only been proclaimed as one of the economically developed States but also has remained at the top amongst the States in conditions of pertinent economic indicators. The Net State Domestic Product (NSDP) and Per Capita Income (PCI) put the State amongst the summit three economically front position States. The NSDP of the State for 2004-05 worked out to 3, 38,254 crores at current prices, which is higher than India's NSDP. In addition to this, the PCI of the State has been continuously higher more than the years as compared to the national average (GoI, 2006). Notwithstanding this knowledge of enlargement, the issue of regional disparities regarding development initiatives crossways regions of Maharashtra has engaged the center stage of discussion for a long (Dandekar Committee, 1984; and Vidwans, 1996). Amid the current studies, we have recognized two sets of studies that generally observe the issue of regional disparities in the State. While the first set analyses the state of economic development athwart regions (Prabhu and Sarker,

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GREEN MARKETING EXECUTION IN INDIA – A CURRENT SCENARIO

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ABSTRACT

Newly environmental issues are playing a vital role in the marketing scenario of India. Different studies by environmentalists indicate that Indian people are more anxious about the environment and are changing their behavior patterns to be less unfriendly towards it. Currently, Indian customers are appropriate more afraid of environment-friendly products which are useful for reducing the deprivation of the environment. Most of them believe that environment-friendly products are harmless to use. At present is the era of recyclable, non-toxic, and environment-friendly goods. This has happened to the new mantra for marketers to satisfy the requirements of consumers and earn better profits. This object introduces the phrase and concepts of green marketing, briefly discuss why going green is necessary to observe several of the reason that organizations are adopting a green marketing belief. It also focuses on some of the problems with green Marketing from an Indian outlook.

Keywords: Green Marketing, Concept, Execution, Environment, India.

INTRODUCTION

It is regularly thought that green marketing refers to the endorsement or publicity of products with environmental uniqueness only. In common green marketing is a much wide conception, one that can be useful to consumer goods, industrial goods, and yet services. For example, in India, various resorts are inauguration to encourage themselves as "ecotourism" amenities, i.e., facilities that concentrate on experiencing nature or working in a fashion that minimizes their environmental impact. Hence green marketing incorporates a large assortment of performance, as well as product variation, changes to the manufacturing procedure, wrapping changes, as well as modifying promotion. The expressions used in this area has different, it includes Green Marketing, Environmental Marketing, and Ecological Marketing.

India is growing at 7% annually and is predictable to double its energy consumption between 2012 and 2030, is under pressure to take action for providing a clean environment for all future generations to come. (Sarunya, 2011) Many Indian companies have come ahead for the reason of environmental concerns and issues requiring instant consideration like global warming, Water and Air pollution, E-waste.

Ø OBJECTIVES :

The objective of this paper is to observe the concept of Green Marketing and to appraise the reasons behind, initiatives empty, problems faced by the Indian companies for green marketing.

Ø MARKETING MIX OF GREEN MARKETING :

When companies approach up and doing with innovations like eco-friendly products, they can right to use new markets, improve their market shares, and increase profits. Now as we have 4Ps product prices, place, and promotion in marketing, we have 4ps in green marketing else, but they are a speck different.

· **Products**

The products have to be developed depending on the requirements of the consumers who rather environment-friendly products. Competent products not only save water, energy, and money but also diminish damaging effects on

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A Study of Diurnal Variation of Agility of Kabaddi Players

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Abstract

The purpose of the study was to compare the diurnal variation of agility of kabaddi players. For this purposes researcher has selected fifteen male (15) kabaddi players from various mandals and clubs of Seloo, Wardha with the help of simple random sampling method. The age of the kabaddi players were ranged between 18 to 25 years. Players did not use any ergogenic aids or supplementations and also they were all free from any injuries during the collection of data. The necessary data was collected at different time of a day the following timing is as follows: 6:00 AM – 7:00 AM, 12:00 PM – 01:00 PM and 6:00 PM – 7:00 PM. The performance of agility was measured with the help of shuttle run. Statistical analysis was done on the basis of One-way analysis of variance (ANOVA) in order to determine the difference if any in diurnal variation of Agility (Shuttle run) of kabaddi players. When the difference was found to be significant the LSD Post hoc test was applied to assess the paired mean difference among the groupshows that there is significant difference between shuttle run at different time of a day because calculated value F is 14.81 which is greater than tab F(0.05(2,42) = 3.219. Since the F ratio is found to be significant, the Least Significant Difference (LSD) Post hoc test shows that the mean difference values 1.13 and 1.47 are greater than the critical difference value 0.907. Hence, the mean difference of morning and afternoon as well as afternoon and evening was found to be significant, whereas the mean difference values 0.35 is lesser than the critical difference value 0.907. Hence, the mean difference of morning and evening is found to be insignificant. It is conclude that the diurnal variation of agility of kabaddi players was found to be significant. The mean performance of agility of kabaddi players at evening time is better than morning time followed by afternoon time. The reason for this difference may be attributed to the nature of the kabaddi players. As the kabaddi players were most probably practice at various clubs and mandals. The practice time of various clubs and mandals are seen at morning and evening. Hence the performance during the evening time better as compared to morning and afternoon time.

Keywords: Diurnal Variation, Agility, Kabaddi Players, etc.

Introduction

Thermoregulation (temperature control) is part of a homeostatic mechanism that keeps an individual at optimum operating temperature, as the temperature affects the rate of chemical reactions. The average internal temperature of human being is about 37.0 °C (98.6 °F), though it fluctuates around this point by 0.5 to 1 °C. However, not a single person has exactly the same temperature at every moment of the day. The temperature of human body is not fixedit fluctuate up and down through the day, as it is controlled by the person's circadian rhythm. Diurnal variation is biological functions are known to occur in almost all living beings, they are controlled by what is called the limbic system, one of the oldest brain section in phylogenic history. The duration of such diurnal variation cycles ranges from a few hours to much longer periods. The 24 hours rhythm is one of the most prominent cycles, which controls variations in body temperature, the pulse rate, the respiratory rate, the hormonal secretion and the amount composition if urine excreted by a person. Body temperature is usually at its lowest (about 36°C) in the early morning hours and at its highest (about 37.4°C) in the late afternoon or in the early evening. These variations can be reversed by merely changing one's daily living habits such as eating and sleeping. According to experts, this variation is credited to the circadian rhythm seen in other areas of physiology and is affects its daily routines such

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E-learning Resources in Rural Development: Current Scenario

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ABSTRACT

The field of education emerge now information and communication technology and techniques that shows now terms of teaching and E-learning. Educational institutes had developed learning management system to facilitate e-learning. There areoutstanding digital separate among urban and rural areas. In this paper, we present a model for providing e-learning services inrural areas in order to promote and facilitate most recent education. Anenthusiastic resource center, hosting the learning management system, facilitates e-learning centers through Internet. The generally goal of this model is to include a cost-effective learning environment setby latest technologies to provide learners an opportunity to get coming into new information and communication technologies and e-learning environment. The model offers new teaching methodology with improveoperation of learning management system in teaching and learning. Essential characteristics and technical aspects will be considered as well. The study will also encourage development and usage of open-source technologies.

Keywords

E-learning, ICTs, Educational Technology, Learning Management System, Open-source Software/Technology.

INTRODUCTION

The incredible development in Information and Communication Technologies (ICTs) has covered the way for e-learning. Uses of computers in education sector know how to be traced back to the early 1980s when simple word processors are in use. The Internet has revolutionized the computer and transportation world like no onefacing. This brings us great learning opportunities by having entrance to large amount of information with benefits in expressions of time and cost savings. The modern educational technology facilitates design, captivity and management of educational activities for learners. This can be face-to-face in a lecture hall, online, or combination of both. Imparting education in this way be termed as e-learning (electronic learning) i.e. learning through information and communication technologies. E-learning facilitates reserve learning and provides means to learners to right to use learning material any time and at any place.

A learning management system (LMS) be alive the software application that facilitates e-learning. Multiplicities of commercial as well as open-source LMSs are available today which are being used in educational institutions.

Predictable learning involves setting up infrastructure of school/college and hiring of faculty and staff. Students contain to attend school/college in order to learn. In the rural areas, development of such institute and hiring of full-time faculty requires a lot of resources. Professionally trained educators generally prefer to work and inhabit in urban areas. Accordingly, the population of rural areas is privileged of quality educators and thus quality education. The current work proposes development of e-learning centers based on ICT to provide high-quality education with modern learning material in rural areas. The models employ latest educational technologies that motivation improves the education standard and will be providing means to initiate educational technology to learners. The learners will cover a chance to get familiar through latest technologies which self-

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Removal of Arsenic using *Cyanobacterial species* by Continuous Flow Fixed Bed Bioreactor System

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Abstract- **Arsenic is one of the significant environmental pollutants and its toxicity directly or indirectly affects the ecology. A continuous flow fixed bed bioreactor is an efficient system for the growth of *Cyanobacteria* and it improves the removal efficiency of many metallic ions. Many times the removal efficiency of the system gets affected when the culture system is not axenic in nature. Continuous flow fixed bed bioreactor which was operated at the steady state was found to be useful in the removal of arsenic from the system. The results show all the three organisms namely, *Anabaena, Nostoc* and *Lyngbya* were able to remove more than 95% of arsenic from the system individually. It can be confirmed that arsenic removal efficiency may possible by *Cyanobacteria.***

Keywords –Heavy metal, Arsenic removal, *Cyanobacterial* spp., Bioreactor system, Continuous flow fixed bed bioreactor.

I INTRODUCTION

Arsenic is toxic element, highly ubiquitous in nature, found naturally in water, soil and rocks and at times the certain quantity of arsenic is also found in living organism like plants, animals and microbes. The environment gets enriched by arsenic due to various natural activities as well as anthropogenic activities. The problem of arsenic pollutions became prominent in the early 20th century. In the last 40 years the menace of arsenic became more prominent in some parts of the world as they were hampering human health because of their capability to enter food chains in large amounts [1], [2]. So it is necessary to development of advanced technologies or arsenic management and treatment.

Various technologies have been used in the arsenic remediation. Some of the common among them are coagulation [3], adsorption[4], ion- exchange [5], electrocoagulation[6], biological processes [7]-[9]and phytoremediation[10]-[12]. Apart from this immobilization technology over biosorping materials have also been reported[13]. Report of arsenic tolerance and removal by Cyanobacterialspecies require a justification for the use of *Cyanobacteria* in the management of arsenic. A continuous flow fixed bed bioreactor is an efficient system for the growth of *Cyanobacteria* as these cells adhere to the matrix system employed in the reactor and improves the removal efficiency of many metallic ions. So far removal of arsenic by such a system has not been reported. Hence the basic intent of employing such a reactor was to evaluate its ability in the removal of arsenic.

II. MATERIALS AND METHOD

A. The design of continuous flow fixed bed bioreactor

A cylindrical glass column having the dimensions of height 66 cm, diameter 3.4 cm, was constructed a reservoir of 2 liter volume was kept at the top and connected to the column via peristaltic pump. The column was filled with stones and pebbles of approximate radius of 0.5-0.6 cm to such a height so that the working volume ranges 400 cm^3 along with the head space of 200 cm^3. The outlet of the column was joined to a discharge bottle which was finally connected to the effluent reservoir. The geometric and the operating parameters of this reactor were calculated after filling the column up to a desire height with stone pebbles. The flow rate of the medium was maintained at around 20 ml/hour. A continuous fed fixed bed photo-bioreactor was constructed and the design of the photo-bioreactor and its accessories are shown in Fig. 1.

Comparative Study of Estimation of Gibberellic acid (GA_3) by Analytical Methods

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Abstract— Gibberellins are plant hormones which act as chemical messengers to control plant growth and development. They ar synthesized via the terpenes route from the geranylgeranyl diphosphate and feature a basic structure formed by an ent-gibberellan tetracyclic skeleton and are involved in a number of developmental and physiological processes in plants. Plants and som microorganisms such as fungi and bacteria produce it. Out of many gibberellins GA_3 is extensively used as plant growth regulator i agriculture, horticulture and plantation crop.

In the present paper gibberellic acid (GA_3) has been produced by solid state fermentation (SSF) process using a fungal strai *Gibberella fujikuroi* NCIM 1099 and solid substrates banana waste, tomato waste ,spinach waste, potato waste, pea waste, maize co waste, sorghum straw waste and pigeon pea pod waste. SSF carried out for 8 days under pre-standardized conditions isolated usin ethyl acetate and crystallized by diethyl ether. The estimation of GA_3 has been carried out by UV/VIS spectrophotometry and revers phase High performance liquid chromatography (HPLC).

PERKIN-ELMER lambda 900, UV/VIS/NIR spectrophotometer has been used for estimation of gibberellic acid (GA_3). An absorptio maximum of gibberellic acid complex (formed with 60 % of concentrated sulphuric acid) was found to be at 277.83 nm.

HPLC instrument with Schimadzu LC-10 system using a Bondapak C-18 column (3.9 mm x 300 mm) with particle size 10 µm an photodiode array detector has been used for estimation of GA_3. Standards of GA_3 and unknown samples prepared in HPLC grad methanol injected in HPLC instrument using the mobile phase methanol. The flow rate of samples has been set at 1ml/minutes. Th maximum absorbance for standard and unknown GA_3 was obtained at 212 nm.

From the straight line equation of standard gibberellic acid (GA_3) solutions unknown GA_3 samples has been estimated and calculate in gm/kg of solid wastes used. The calculated yield of GA_3 obtained from SSF of pigeon pea pod waste was superior in bot UV/VIS/NIR spectrophotometry (18.99 ± 2.87 gm/kg) and HPLC (15.01 ± 2.35 gm/kg) to the other wastes used for production gibberellic acid.

Key words— Gibberellic acid (GA_3), *Gibberella fujikuroi* NCIM 1099, Solid state fermentation, UV/VIS/NIR spectrophotometry, Hig performance liquid chromatography (HPLC).

I. Introduction

Gibberellins are important plant growth regulators. They are synthesized via the terpenes route from geranylgeranyl diphosphate. The basic structure of gibberellins formed by an ent-gibberellane tetracyclic skeleton. Among 136 isolated GA_3 gibberellic acid (GA_3) has received the most attention.

Gibberellic acid (GA_3) is the main product of gibberellins in fungi and bacteria [2] and involved in number of developmental and physiological processes in plants. They are endogenous hormone functioning as plant growth regulator such as development of plant such as germination, stem elongation, dormancy, sex expression and fruit senescence,expansion of leaves an flowers[2-4].They stimulate the activity of transference, generating higher development of xylem and phloem in ligneous plan [5-7]. These properties make gibberellins a valuable tool in agriculture to increase yield[1][8].

GA_3 is found in plant, algae, fungi, and bacteria. However, due to high concentrations in fungus industrial production of GA_3 are performed by submerged fermentation of the ascomycetes fungus *G.fujikuroi*. Production by plant extraction is not viabl became of low concentrations of GA_3, which contributes to waste generation [9].GA_3 is one of the best-selling and mos important plant growth regulators (PGR). Because of the high investment and involved production costs, only few are stil engaged in developing PGRs, reducing its large utilization [10].

In the present work gibberellic acid was produced by solid state fermentation (SSF) process using a fungal strain *Gibberell fujikuroi* NCIM 1099 fruits and agriculture waste of banana peels, tomato waste, spinach waste, potato waste, pea pod waste maize cobs, sorghum straw, pigeon pea pod waste. The isolated gibberellic acid (GA_3) has been estimated by UV/VI spectrophotometer and reverse phase High performance liquid chromatography (HPLC).The estimated GA_3 quantified in gk and yield has been compared.

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A review on Nanotoxicology: Aquatic environment and biological system

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ABSTRACT

Nanotoxicology is a field of new and emerging research area in toxicology. This stream is related with the toxic effects of nanomaterials (NMs) on health and environment. They pose dangerous health effect, societal threat and environmental hazards due to their nanoscale diamensio. Physical, chemical properties of NPs and environmental factors collectively influence NPs behaviour and toxicity. The mechanism of NMs influencing the toxicity has been studied. Reactive oxygen species (ROS), oxidative stress, ecotoxicity, genotoxicity represents some mechanism. Here, this review will focus on topics including to chemical and physical properties of NMs and characterization for proper toxicological evaluation, exposure, environmental fate and transport, ecotoxic and genotoxic effects. This article discusses about possible sources and routes of NMs in the aquatic environment.

Selection and peer-review under responsibility of the scientific committee of the International Conference on Advanced Functional Materials (Innovations in Chemical, Physical and Biological Sciences).

1. Introduction

Nanotoxicology deals with the special problems caused by nanoparticles. The toxicity of nanomaterials/nanoparticles on life and environment is determined by nanotoxicology. Nanotoxicological studies are intended to know and understand environmental and health issues [1]. Nanoparticles may cause toxicity in various ways. It may interact with blood, tissue fluid and also can enter the central nervous system and affect cardiac and cerebral functions. During the transfer through various site of organism, nanoparticles may bind with mediators which can activate inflammatory responses [2]. Nanotoxicology was proposed as a new branch of toxicology to address the gaps in knowledge and to specifically address the adverse health effects likely to be caused by nanomaterials. Complexity of toxicity of nanoparticles is given in Fig. 1 [3].

Engineered nanomaterials (ENMs), form the hub for growing industry and manufactured products. The use of engineered nanomaterials increases nowadays. There is also an uncertainty, how it effects on biological system. The unawareness about biological effects of NMs creates concern regarding their potential for causing unexpected adverse health effects. During past decade research on environmental impacts of NMs has been flourished but studies on environmental fate, transport, and toxicity of a variety of nanomaterials are still lacking. In this review role of NMs in the aquatic environment and biological systems has been reviewed.

2. Physical and chemical properties of NPs influencing their toxicity

Physical and chemical properties of NMs make them suitable in several applications for humans such as medicine, energy production and also adversely affect the humans and the environment like penetrance in biological barriers causing cell damage. The physicochemical characteristics of nanomaterials, including their chemical composition, shape, size, stability, functionalization, charge, porosity and hydrophobicity/hydrophilicity, agglomeration or aggregation, mainly affect their interactions with biological molecules. In Fig. 2 the most important parameters of nanoparticles are summarized [4]. The impact of nanoparticle characteristics in their toxicity is represented in Fig. 3 [4].

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Microstructure characterization of male and female external genitalia of soapberry bug, *Leptocoris augur* (Hemiptera: Rhopalidae)

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External genitalia, host plant, *Leptocoris*, sensilla, SEM

ABSTRACT

Morphological studies were conducted on male and female genitalia of *Leptocoris augur* (Fabricius, 1781) by using light microscopy as well as scanning electron microscopy (SEM) studies. Detailed morphological descriptions of the genitalia of *L. augur* (male and female) were studied for the first time. Five main types of sensilla, i.e., sensilla trichoidea, sensilla basiconica, microtrichia, sensilla coeloconica, and setae, were observed, and their possible role with respect to taxonomy, host plant selection, and copulatory behavior have been discussed.

1. INTRODUCTION

Heteropteran "stink bug" (e.g., Pentatomidae) possess scent glands in their abdominal segments that secrete an unpleasant smelling substance to save themselves from being attacked. On the contrary, the Rhopalid bugs, *Leptocoris augur* (Fabricius 1781), do not have any scent gland(s) in their abdominal segments, which is a characteristic of the Rhopalidae family [1]. They are plant bugs and belong to the superfamily Coreoidea, which includes 21 genera [2]. The Rhopalid bugs are commonly called scentless plant bugs, as the scent glands are absent. However, this term is misleading and inappropriate (in terms of identifications) because some rhopalids commonly produce redolent compounds [3].

External genitalia and its microstructure play an important role in identifying species; in some instances, it is difficult to identify on the basis of morphology only [4]. Rhopalidae bugs are particularly "plant bugs", as they are always associated with plants [5–7]. Mead and Fasulo [1] and Barsagade and Badwaik [8] reported on Sapindaceae as primary hosts plants for *Leptocoris* and its closely related genus *Jadera*. In addition, we also noted that the bug, *Leptocoris*, colonizes on other secondary host plants like, *Butea monosperma* (Palas), *Euphorbia geniculata* (Dudhani), *Ampelocissus latifoloa* (Dokela), *Ceiba pentandra* (Savar), *Psidium guajava* (Guava), *Bougainvillea*, and *Lablab* sp. (Fig. 1a–f). Scentless plant bugs, *L. augur* and *Liorhyssus hyalinus*, are economically important, as they can attack certain vegetable crops like cucumber, pumpkin, and cabbage, which leads to economic loss [9,10]. To avoid such damage, pest population (e.g., plant bugs) needs to be checked. In addition, to study the behavioral aspect and alternative pest control strategies (e.g., pheromone traps), the sensory microstructure has been investigated during the course of the present study.

The external genitalia of plant bugs have been characterized for taxonomic applications, while the external female genitalia of the Triatominae subfamily have been rarely characterized for taxonomy [11–13]. Scanning electron microscopy (SEM) study of the external genitalia of some insect species, e.g., *Rhodnius prolixus*, *Rhodnius colombiensis*, *Panstrongylus herreri*, and *Panstrongylus megistus*, suggests the role of its genitalia morphology in taxonomical study [14].

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Many workers have dealt with the morphological studies of Rhopalidae family for the life cycle and host plant studies [9,15–18]. However, the present study provides a detailed description of both male and female genitalia of soapberry bug, *L. augur*, based on scanning electron microscopic studies for the first time. The study revealed the presence of different types of the sensillae present on genitalia, and their possible role and structure of the ovipositor have been discussed. Examination of external male and female genitalia of *L. augur* suggests that it may be helpful for the taxonomical studies of the Rhopalidae family. Moreover, it would be a preliminary report to study these bugs more in details to study behavior and to address the pest control strategies of the soapberry plantations.

2. MATERIALS AND METHODS

2.1. Insect Resources, Study Site, and Field Observation

The soapberry bug *L. augur* is a major pest of the "*Reetha*" plant, *Sapindus saponaria* L. (Family: Sapindaceae). The bugs and host plant studies were conducted in and around the RTM University Campus, Amravati Road, Nagpur, Maharashtra, India (21° 14' N, 79° 03' E), located in the Deccan peninsular plateau.

The study site was dominated by the host plant, *S. saponaria* (Sapindaceae), with enormous bugs population, from where the sample were collected for the present study (Fig. 1, a-f). The collected specimens, i.e., nymphs and adult bugs, were brought to the laboratory and colonies were maintained during the course of the present study. During the period of study, the environmental parameters were recorded. The average annual temperature was 27°C, the average annual humidity was 50%, and the average annual precipitation was ~1,100 mm. *Leptocoris* bugs were collected from the month of October to January, from the year 2012 to 2014. The average temperature range was between 17.4 ± 0.4°C and 21.2 ± 0.3°C, and the relative humidity was 77.2 ± 0.6%, and the mean rainfall recorded was 39 ± 0.5 mm.

2.2. Light Microscopy

For the light microscopic study, the external genitalia with the last abdominal segments were dissected out under the stereoscopic binocular microscope (Carl Zeiss Stemi DV4). The freshly dissected genitalia and ovipositor assembly were treated with 10% KOH (hot) for 15–20 minutes. The material was washed in acetone to remove the content of KOH, then dehydrated in ascending grades of alcohol and cleared in xylene, and mounted in dibutylphthalate polystyrene xylene (DPX).

2.3. Scanning Electron Microscopy (SEM)

For scanning electron microscopy, adult male and female external genitalia were dissected in saline water. The dissected parts were washed thoroughly and dehydrated in graded series of alcohol, for 5–10 minutes in each grade. The material was cleared in xylene, air-dried in room temperature, and mounted on SEM metallic stubs under the stereoscopic binocular microscope (Carl Zeiss Stemi DV4). The materials were coated with the thin layer of platinum in vacuum evaporator, evaced, and scanned under the JEOL JSM-6380A SEM. Observations were carried out at the Instrumentation Centre, Vishvesvaraya National Institute of Technology (VNIT) Nagpur, India.

2.4. Statistical Analysis

Morphological measurements of the ovipositor, adeagues, valvifers, and sensilla present on the external genitalia of the male and female bugs were calculated. The software application Digimizer Version 4.6.1 MedCalc was used for the image analysis and some calculations. The Microsoft Excel software was used to calculate an arithmetic means and standard errors.

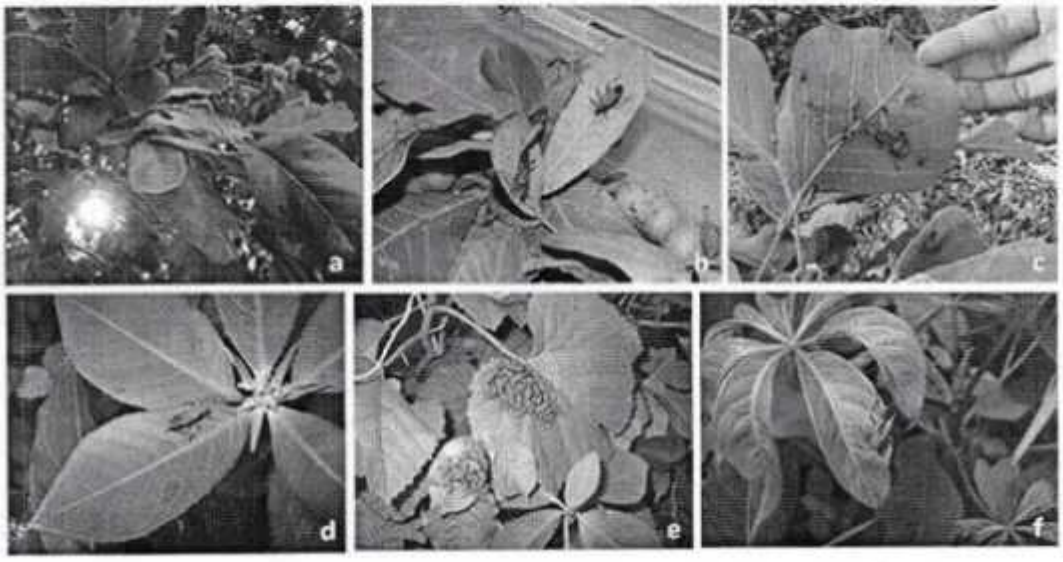

Figure 1 . Host plants. (a) *S. saponaria*, (b) *S. saponaria* (rearing box), (c) *B. monosperma* (Palas), (d) *E. geniculata* (Dudhani), (e) *A. latifolia* (Dokela), and (f) *C. pentandra* (Savar).

A comparative study of Innovations and Agricultural reforms towards Digital India

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Preface: -

The era of current century changing rapidly. Every area is undergoing rapid changes over time. One thing that has not changed in the country's landscape is the suicide of farmer under the burden of debt. It is'still continuing, but statistics say that, since 1995, farmer's suicides have been steadily increasing. The courts of the country took cognizance of farmer suicides cases and asked the government to promote the rural friendly policy for farmers. More than half of the country's people get employment from agriculture, yet why is the agriculture sector in so badcondition? Why does the farmer get a little bit profit in return against the mountain profit of industries? Today, the scientists, researchers, entrepreneurs and the government of the country need to make efforts to meet the challenges of the agriculture sector and to find employment opportunities in the agriculture sector.

With the advent of robotics, 3D printing and digitally controlled lasers, the manufacturing sector has become so automated that it is not possible for an unskilled agricultural labourer to have the option to work in a factory. The best way to deal with the problem is to develop skill in 'E-agriculture entrepreneurship". For which government and non- governmental organisations are playing an important role. Information technology and universality have given rise to diverse possibilities for a bright future in e- commerce. Today every big e-commerce businessman is looking for trained employees. Discussion of e-commerce is now happening in big cities as well as small towns. The number of people doing business through the internet is increasing. E-commerce is the new way of doing business. There is new way of better use of new technology and concrete means of establishing a company. If farmers and youth have to establish their supremacy in the era of modern competition, then they will have to be constantly connected to the world of new technological knowledge and modern mechanization. Being self –reliant, young generation should accept agricultural entrepreneurship as a better employment opportunity.

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An Analytical Study of Institutional Infrastructure for Export Promotion: Issues and Implications

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Introduction

The structure of Indian exports is typical of a developing economy. India has traditionally been an exporter of agricultural raw material and manufactures based on agricultural raw material. There has been continues decline in the share of agricultural raw materials and allied products. One reason for the relative decline of food, beverages and tobacco in the total exports is the increase in population and consequent increase in domestics' consumption of these goods. Accordingly, the export surplus in many traditional commodities like Tea, has not been increasing as much as the Government would have wished. In this connection the growing importance of certain product, cashew kernels, coffee and rice. Vegetable and fruits are also growing in importance.

Since 1960, under the impact of industrialisation exports of non-traditional items are gaining in importance. These items consist of engineering goods, handicrafts, which include pearls, precious and semi-precious stones and jewellery, iron and steel, machinery and metal manufactures, chemicals, readymade garments, fish and fish preparations. These goods constitute about 70 per cent of Indian export. The fact that some of these non-traditional item's such as engineering goods, handicrafts, ready-mades etc. have established themselves in the markets of even the most advanced countries show that they would continue to be part of India's exports in the years to come.

India is now in a position to take advantages of both favourable demand situation and attractive price situation in international market. While some commodities have tremendous exports potentials e.g. handicrafts, engineering goods, ready-mades, sugar, jute, yarn and manufactures, iron and steel have fluctuated widely. With the announcement of the new agricultural policy emphasis is being given to boosting the export of agricultural products. Rice export is gaining importance besides this fruits and vegetables and processed foods are also becoming significant in our exports.

The export promotion programmes Initiated by the Government

A Firm has to overcome several barriers in its process of internationalization. It, therefore, become necessary for an export manager to know about the institutional

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Green Synthesis of Novel Substituted 4, 4-Biphenothiazine Derivatives

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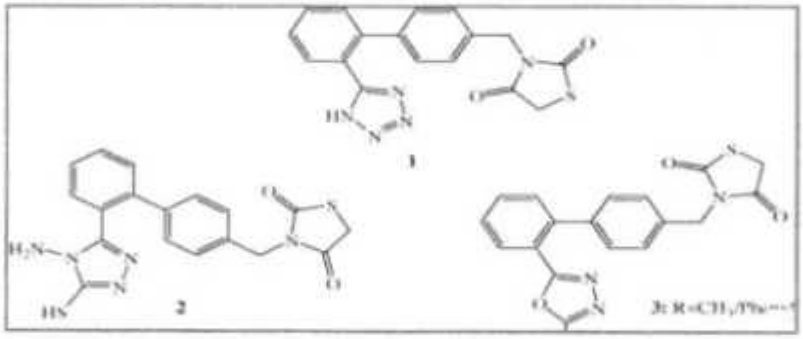
ABSTRACT

In this paper, common heterocyclic system contains nitrogen or oxygen or both plays an important role in the evolution of life. Comparison of conventional and microwave assisted synthesis of 4, 4 Biphenyl and 4, 4-Biphenothiazines is an intermediate use in the manufacture of thermoplastics such as liquid crystalline polymers, polyesters, polycarbonates and polysulfones. A new class of 4, 4-Biphenyl and 4, 4-Biphenothiazines derivatives condensed with different aldehydes under micro synthesized compounds has been characterized by IR, 1H, NMR and mass spectral data. The compounds were then evaluated for antimicrobial activities.

Graphical Abstract



Tetrazole derivatives.

Keywords: Biphenyl, Phenothiazine, Substituted aldehydes, Biological activities.

INTRODUCTION

The 4,4'-Biphenol is an organic compound which is phenolic derivative of biphenyl are estrogenic and cytotoxic .The biological activities of 4,4'- biphenol, 2,2'-biphenol and phenol are discussed in the light physicochemical parameters such as stoichiometric factor (n), BDE. Phenol is one amongst oldest antibacterial agent. The redox and acidity properties of 2, 2' and 4, 4' biphenol and the corresponding phenoxyl radicals have been determined using UV-Visible spectrophotometer pulse radiolysis and cyclic voltammeter. 4, 4' biphenol it is prepared by dealkylation of the tetra-t-butyl

of which may be more stable and trait-like, whereasothers may be more context-dependent and changeable over time.

Conclusion:

There are three layers of moral identity that develop across the lifespan. Future theory and research on moral identity need to consider these three layers and that it is important and possible to nurture thedevelopment of each layer of moral identity beginning in middle childhood in order tobetter predict moral behavior. In our current political global climate, it is increasinglyimportant to cultivate moral citizens who are accepting and understanding of others andthus are more likely to disengage from immoral acts.

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Bibliometrics And Bibliometrics Law

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Abstract :

Bibliometrics have these days won a spot and is thought to pact with quantification of written verbal exchange-books and other media. This suggests tallying or estimating the recurrence of the writing is the fundamental two different ways. Via an extension or the period time, we're nonetheless with Ranganathan's coined period time, librametry, on the grounds that bibliometric considers incorporating measurable ways to deal with the investigation of library and its administration. In this paper presenting the biblometrics and its law.

Keyword : bibliometrics, Bradford law, Zips Law ,Lotka's Law

1. Introducton

Historically the beginnings of the use of statistical technique were in vogue 1917 by Cole and Eales who conducted a study by counting and categorizing publications by country of origin and by field. The study analyzed the data by counting the number of titles, both books and journals, articles and grouping them by country. In 1922, Hume introduced the term "Statistical Bibliography". The term was unspecific and scarcely used. The technique was explained as 'to shed light on the process of written communication and of nature and course development of discipline through counting and analyzing the various fact of written communication'.

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Research Article

A COMPETENT AND AN ECONOMICALLY CHEAP SYNTHESIS OF AMIDES CATALYZED BY CALCIUM CHLORIDE

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ABSTRACT

$CaCl_2$ has been found to be an efficient and economically cheap catalyst for the rapid synthesis of amides in high yields. The use of stoichiometric quantities of acetic anhydride under solvent free conditions without any additional purifications makes this etiquette a safe and sound alternative to the existing methods.

Keywords: Amide, acetylation, amine, $CaCl_2$.

1. INTRODUCTION

The protection of any functional groups in protection and deprotection techniques via environmentally compassionate trial is vastly advantageous as are the commonly encounter employ for the synthesis of complex organic materials. Hence, a group is one of the most important group present in surplus of biologically relevant compound. Many protective groups are available for the protection of amine functionality. Of which acetyl group is the most common being stable in acidic conditions and can be removed easily under alkaline conditions [1]. Different reagents used for the acetyl protection of amines are acetic acid, acetyl chloride [2] anhydride [3], acetyl acetone [4], zinc acetate [5] acetic acid [6], and thioacid [7]. Amongst, acetic anhydride is the most commonly used reagent as it is cheap, readily available and easy to handle. Besides their use as a protecting group, amides are present in various important natural products and pharmaceuticals such as lacosamide, paracetamol, zonisamide, *etc.* that are required in mass quantities. Various methods are available for the amide synthesis underacidic as well as basic conditions using acetic anhydride [8].

However, most of the methods suffer from less or more demerits such as tediuos conditions, elevated temperatures, costly catalysts and reagents, more reaction times and high toxicity. Recently, Kim [9] *et al* reported the synthesis of acetamides using sulfated choline ionic liquid as a catalyst using grindstone method, though this method is quite efficient in terms of yield and reaction times, however the catalyst is not commercially available, and require preparation. To overcome these drawbacks still there is a chance to develop a new catalyst system that can minimize these boundaries. Therefore, desirable efficient catalysts which are more economical, environmentally friendly and use stoichiometric amount of reagent in absence of volatile organic solvents. Calcium chloride ($CaCl_2$) is a readily available, cheap dehydration reagent used and recently gaining thrust as a green catalyst in various organic reactions. To exemplify, $CaCl_2$ has been used in Kabachnik-Fields [10] Mannich reaction [11], Biginelli three component reaction [12] and aldol transformations [13]. In recent times, it has been utilized as an efficient Lewis acid catalyst for the synthesis of 9-aryl-1, 8-dioxooctahydroxanthene [14].

2. MATERIAL AND METHODS

All commercially available reagents were used without purification. Acetic anhydride was distilled prior to use. Reaction was monitored by using TLC plates (Merck Silica Gel 60 F254), I_2 and anisaldehyde in ethanol as development reagents and visualization with UV light (254 and 365 nm). Mass spectra were recorded on LC-MS. Optical rotations were measured with a JASCO P 1020 digital polarimeter. ^1H and ^{13}C NMR spectra were recorded on a Bruker AC-200 NMR spectrometer. Spectra were obtained in $CDCl_3$. Chemical shifts are reported in δ (ppm) and coupling constants are reported in Hertz (Hz).

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Physico-Chemical Analysis of Soil Sample from Wardha District

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ABSTRACT

Natural environment is very healthy and suitable for all kinds of organisms, but his various activities though he is the climax of creation of this world, polluted which resulting environmental pollution. About thirty representative samples were obtained and analyzed for its alkalinity content, sulphate, pH, chloride, conductivity, sodium and potassium. The value of chloride content was ranging from 1.20 to 2.00 g/100g, alkalinity was found to be from 2.5 to 85.0 meq/100 gm, sulphate was found to be between 0.067 to 0.745 g . conductivity was ranging from 0.5 to 2.0 micro mohs, range of sodium was between 150.6 to 250 ppm and potassium from 100.9 to 190 ppm.

Keywords- Physico-chemical analysis, soil samples, pH, Sodium-potassium.

I. INTRODUCTION

Soil is a fundamental component, medium of nutrients and materials, forms the life layer of earth. It developed as a result of pedogenic processes through weathering of rocks, consisting of inorganic, organic, soil organisms, soil moisture, soil solution and soil air. approximately, the soil contains 50-60% mineral matter, 15-25% air and little percentage of organic matter (Chatwal et al, 2005).

Soil possesses definite, physical, mineralogical and biochemical properties, having inconsistency from depth to surface of the earth, and provides a medium for the growth of plant Kingdom [1]. The soil forms the intermediate zone between the atmosphere and the rock layer of the earth, the lithosphere. It also forms the interface between hydrosphere and the lithosphere and thus forming a part of biosphere. The soil may be defined as the uppermost weathered layer of the earth's crust in which are mixed organisms and products of their death and decay. Soil pollution is caused by more and more use of minerals to soils by man, from the use of agriculture chemicals such as herbicides, fungicides and insecticides, from the dust fall and precipitation and use of chemical fertilizers and contaminated water. It is also caused by the industrial waste, agricultural waste, urban waste, biological pathogens etc.

The industrial pollution increases the soil toxicity. The soluble salt given out as pollutants damages the cultivated farms. The soil pollution due to sewage is also very high. Several diseases are inflicted in human beings due to pathogenic forms present in the soil. It is the need of every time that we have to study the physico-chemical parameters of soil to know its quality. Thirty representative samples were collected from

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PHYSO-CHEMICAL ANALYSIS OF WATER SAMPLE FROM SELOO TAHSIL OF DISTRICT WARDHA MAHARASHTRA

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ABSTRACT
The water quality is determined in various area of seloo city of wardha district. The water samples taken from Various area from house well, Borewell water. In Physico-chemical analysis, various quality parameter are measured including pH, Specific conductivity (SP), total dissolved solids (TDS), total hardness, compared with WHO standards of water quality; also in present research paper classification of water samples of various sites was investigation on the basis of TDS, anions, cations and TH. All Parameters were within the permissible limits. The results indicated and discussed.

Keywords- physico-chemical analysis, TDS, COD, BOD, Nutrients and Total Hardness.

INTRODUCTION-

Water plays an essential role in human life. Although statistics, the WHO reports that approximately 36% of urban and 65% of rural Indian were without access to safe drinking water . Fresh water is one of the most important resources crucial for the survival of all the living beings. It is even more important for the human being as they depend upon it for food production, industrial and waste disposal, as well as cultural requirement . Human and ecological use of ground water depends upon ambient water quality. Human alteration of the landscape has an extensive influence on watershed hydrology . Ground water plugs a vital role in human life. The consequences of urbanization and industrialization leads to spoil the water for agricultural purposes ground water is explored in rural especially in those areas where other sources of water like dam and river or a canal is not considerable.During last decade, this is observed that ground water get polluted drastically because of increased human activities. Consequently number of cases of water borne diseases has been seen which a cause of health hazards. An understanding of water chemistry is the bases of the knowledge of the multidimensional aspect of aquatic environmental chemistry which involves the source, composition, reactions and transportation of water. The quality of water is of vital concern for the mankind since it is directly linked with human welfare. It is a matter of history that facial pollution of drinking water caused water-borne diseases

METHODOLOGY-

The Water Samples were collected from various sites in the Morning Hours between 9 to 11am, in Polythene Bottles. The Water samples were immediately brought in to Laboratory for the Estimation of various Physico-chemical Parameters like Water Temperature, pH were recorded by using Thermometer and Digital pH Meter. (Systronics). Specific conductivities were measured by using digital conductivity meter. The TDS values were measured by using TDS meter. While other Parameters Such as Hardness, Sodium, and potassium by Flame

photometry. Manganese, Calcium & Magnesium Chloride, Sulphate and Nitrate were Estimated in the Laboratory By using Standard laboratory methods. Present Study involves the Analysis of Water Quality in Terms of Physico-chemical methods. (Trivedy and Goel, 1986) increased in the similar direction, i.e., from Sample 1 to Sample 4. Concentration of nutrients like Chloride, Sulphate was within the permissible limits for Sample- 3 & 4. BOD remined less than 3 in all cases, showing normal microbial activity. Physicochemical parameters affected the primary production in different Areas. The physicochemical of chemical characteristics of water samples in the study area suggested that there was no harmful chemical contamination.The sample 3 & 4 were found to be more free from various micro gram positive bacterial activities. The sample - 4 is more healthier in the long run.

Parameter Included In Water Quality Assessment

Following different physico-chemical parameter are tested regularly for monitoring quality of water.

1) Temperature: Temperature is the most importance environment factor with effect on plants and animals. Water has several unique thermal properties which combine to minimize temperature change. The Water temperature depends on the depth of the water column, climatic and topographic changes.

2) pH: pH, one of the most common analyses in soil and water testing, is the standard measure of how acidic or alkaline a solution is. It is measured a scale from 0 -14. pH of 7 is neutral, pH is less than 7 is acidic and

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Lost in Time: Re-description and Ecological Re-assessment of two Indian Endemic *Elattoneura* Cowley, 1935 (Platycnemididae) Damselflies

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Abstract: The Indian *Elattoneura* are a difficult group to identify due to their extreme morphological similarity and sparse information in identification keys and on geographical distribution. The ambiguity is prominent among two Peninsular Indian *Elattoneura* species, *E. nigerrima* (Laidlaw, 1917) and *E. tetrica* (Laidlaw, 1917), described a hundred years ago. Both species were described based on male specimens with scant information on their females. The species are IUCN Red-listed, *E. nigerrima* (Data Deficient) and *E. tetrica* (Least Concern). Hitherto it was thought that *E. nigerrima* was smaller than *E. tetrica* and both have non-overlapping geographical distribution. Here, we re-describe both sexes of *E. nigerrima; E. tetrica* along with morphometric data and geospatial analysis. We found that *E. nigerrima* is significantly larger than *E. tetrica*. The species are largely allopatric in distribution, with the former having a much wider spatial distribution than previously thought. Based on our geospatial analysis, we provide occurrence data useful for the future IUCN assessments of *E. nigerrima* and *E. tetrica*. We highlight the importance of updating taxonomic status information and data on spatiotemporal distribution to proceed with the conservation of endemic insects such as *Elattoneura* damselflies. Our study indicates ecological and threat assessments of Indian Odonata species are urgently needed.

Keywords: Odonata, dragonfly, citizen science, conservation, Morphometry, re-description, Peninsular India, threadtails

Introduction

Extreme morphological similarity among species often hinders accurate identification. Ambiguity in identification can result in severely erroneous data on the natural history and ecology (Chesters, 2017). If the species of interest are rare, endemic or endangered, such taxonomic ambiguities can severely hamper undertaking conservation measures (reviewed in Bickford et al., 2007; Delić et al. 2017). Misidentification problems are often encountered in tropical insects as the majority of the groups exhibit a high level of cryptic diversity; therefore accurate taxonomic identification of such species takes an enormous amount of expertise, time, cost, and human resources (Stork, 1988; Gadagkar et al., 1989; Godfray et al., 1999). Improper taxonomic identification of species may severely affect the assessment of conservation status of many taxa (Cardoso et al. 2011, Chenuil et al.,

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Article

Dragonflies and damselflies (Odonata: Insecta) of the Seloo city, Wardha, Maharashtra, Central India

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Abstract
Dragonflies and damselflies (Odonata) species diversity was studied in the Seloo city from 2011 to 2021. Its geographical location is 20083'73''N; 78070'70''E; 265 m. A total of 62 species of odonates belonging to 2 Suborders and 8 families were recorded. The highest number of odonates belong to the family Libellulidae (30 species) followed by Coenagrionidae (13 species), Aeshnidae (5 species), Gomphidae (4 species), Platycenemididae (3 species) and Lestidae (4 species), Macromiidae (2 species) and Chlorocyphidae (1 species). Of the total, 30 species were abundant or very common, 16 were common, 6 were not rare, 7 rare and 3 very rare. Among all, 3 species were Data Deficient, *Indothemis carnatica* (Fabricius, 1798) are listed as Near Threatened and 57 were least concern in IUCN red-list of threatened species. The observations support the value of the Seloo city area in providing valuable resources for Odonata.

Keywords Odonata; diversity; Seloo city; Wardha,;Mahrashtra; India.

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1 Introduction

Odonata (damselflies and dragonflies) are very interesting and diverse insects. Odonata are paleopterous, exopterygote aquatic insects, probably more closely related to the Ephemeroptera (mayflies) than any other living insect group. They instantly attract attention with their amazing flight skills and beautiful colours. Odonate is prominent freshwater insects and plays an important role in wetland and terrestrial food chains as predators. The adults are generally predacious insects, while the larvae are carnivores and voracious feeders. They are also actively used in controlling causative agent of malaria and filaria throughout the world (Tiple et al., 2008). Even though species are usually highly specific to a habitat, some have adapted to urbanization and use man-made water bodies. They probably mark the first time that evolution experimented with the ability to hover in air over an object of interest. Being primarily aquatic, their life history is closely linked to specific aquatic habitats. Naturally, these insects become a marker, an indicator of wetland health (Andrew et al., 2008).

Dragonflies mostly occur in the vicinity of different fresh water habitats like rivers, streams, marshes, lakes

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COMMUNICATION

Dragonflies and damselflies (Insecta: Odonata) of Jabalpur, Madhya Pradesh, India

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Abstract: The present study was carried out to reveal the odonate diversity in Jabalpur city and its surrounding area in Madhya Pradesh, central India. During the study period of 2008–2019 a total of 75 species of odonates belonging to two suborders and nine families were recorded. Twenty-one new species were recorded for Jabalpur district and four for Madhya Pradesh; 37% (28) species were abundant or very common, 19% (14) were common, 16% (12) were frequent, 24% (18) rare, and 4% (3) very rare. The maximum number of odonates were found in family Libellulidae (n= 32), followed by Coenagrionidae (n= 17), Gomphidae (n= 09), Platycnemididae (n= 06), Aeshnidae (n= 05), Lestidae (n= 03), Macromiidae (n= 02), and Chlorocyphidae (n= 01). Of 75 species recorded from Jabalpur city, 72 come under the IUCN Red List. Among them, *Indothemis carnatica* come under Near Threatened (NT) category, 65 species come under Least Concern (LC) Category, six species under Data Deficient (DD), and three species remain not assessed. The study supports the value of the city area in providing habitat for Odonata.

Keywords: Central India, checklist, conservation, distributional gaps, diversity, habitat, IUCN Red List, new records, Odonata.

सर्वेक्षण अध्ययन मध्य भारत के मध्य प्रदेश में जबलपुर शहर और इसके आसपास के क्षेत्र में ओडोनेट विविधता को पकड़ करने के लिए किया गया था।2008-2019 की अध्ययन अवधि के दौरान दो उपवर्गों और नौ परिवारों से संबंधित ओडोनेटा की कुल 75 प्रजातियों को दर्ज किया गया था।जबलपुर जिले के लिए इक्कीस और चार मध्य प्रदेश के लिए एक नई प्रजातियां दर्ज की गईं; 37% (28) प्रजातियां प्रचुर या बहुत आम थीं, 19% (14) आम थीं, 16% (12) अक्सर दिखाई देती थीं,24% (18) दुर्लभ और 4% (3) अति दुर्लभ थीं।लिबेलुलिडे (सख्या=32) परिवार में ओडोनेट्स की अधिकतम संख्या पाई गई, इसके बाद ग्रुप परिवार: दिग्नी प्रजातियां दर्ज की गई हैं संख्या के क्रमांक में इस प्रकार हैं- कोएनाग्रिओनिडे (संख्या=17), गोंफिडे (संख्या=09), प्लेटीसेनेमिडिडे (संख्या=06), एशनिडे (संख्या=05), लेस्टिडे (संख्या=03), मैक्रोमिडी (संख्या=02), और क्लोरोसाइफिडे (संख्या=01)। जबलपुर शहर से दर्ज 75 प्रजातियों में से 72 आईयूसीएन रेड लिस्ट के अंतर्गत हैं।उनमें से इंडोथेमिस कार्नेटिका निअर थ्रेटड (एनटी) श्रेणी के अंतर्गत आती है, 65 प्रजातियां लीस्ट कंसर्न (एलसी) श्रेणी के अंतर्गत आती हैं, छह प्रजातियां डेटा डेफिशिएंट (डीडी) के अंतर्गत आती हैं और तीन प्रजातियों का मूल्यांकन नहीं किया जाता है।सम्पूर्ण ओडोनाटा के लिए आवास प्रदान करने में शहर के क्षेत्र के महत्व का समर्थन करता है।

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Author contributions: ADT and SVP designed the study, carried out the fieldwork, analyzed the data and prepared a draft; VS carried out the fieldwork and revised the final draft. ADT, SVP and VS helped with the preparation of the manuscript and revised the draft.

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BIOCONVERSION AND NUTRITIONAL PERFORMANCE OF BLACK SOLDIER FLY, HERMECIA ILLUCENS L. NURTURED ON CHICKEN & FISH MARKET WASTE

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ABSTRACT

Black soldier fly, *Hermecia illucens* L., a dipteran insect native to Neotropical region, becoming popular due to its high attribute on transforming organic waste into salubrious vittles' for poultry and livestock. Black soldier fly larvae fed on organic waste, reduces the environmental pollution and convert organic waste into insect biomass containing protein, fats and essential nutrients which can be utilized for livestock feed. Costly protein diet, fat supplement and compound feed diet formulations madeof fish and soyabean can be replaced with Black soldier fly larval biomass production and can be a remedy for the future food and feed demands. The waste generated in chicken/meat slaughter houses and fish market are not recycled in villages as well as in urban areas and these are thrown in open places which can nurture pathogens and vectors that may lead to spread of diseases. BSF larvae are capable to recycle these market wastes and can gain nutrient rich insect biomass. In this study BSF larvae from fifth day old till prepupal stage were fed continuously on chicken slaughter house waste and fish market waste. When larvae reached last larval stage, larval biomass conversion and nutrient parameters were recorded. It is concluded that these two-market wastes can be recycled efficiently by using BSF larvae and various nutrients rich larvae can be utilized for livestock feed. Findingsfrom the larval nutrient composition can provide data for food and feed industry for formulating their molecular nutritional constituent intakes into the diet of livestock.

KEYWORDS: Black soldier fly, *Hermecia illicens* L., recycling, organic waste, biomass conversion, nutritional parameters,Fish market waste, Chicken market waste, livestock stock feed.

INTRODUCTION

The solid waste management in a country must be one of the priorities while forming policies at the National level (Abas, M.A. et. al. 2014). Among the entire solid waste stream, organic waste accounts for more than 78% in developing countries (Bhada-Tata et. al. 2012), it is often dumped in landfills without separation leading to the loss of valuable organic resources that could be recycled (Njoroge, B. et. al. 2014). Human health is very much related to the environmental degradation(Shukla, S.R. et. al. 2000). The health risk increases and there are the chances of infection of gastrointestinal parasites to the people who live near dumping areas and if workers do not use gloves or safety equipment (Giusti, L., 2009). Open dumps release methane after decomposition of biodegradable waste under anaerobic conditions which is a major contribution to the global warming (Slagstad, H. et al. 2013). Biodegradable waste produces odour and leachates which migrates to water source and in soil causes pollution (Unnikrishnan, H. et al. 2006, Muhammad, N. et al. 2020, Dasgupta, B. et al. 2013).

In increasing world population human and animal feed production are expected to increase from agriculture by 60% (Tomberlin JK, et al. 2015). Maize, rice, wheat and soybean shortage will be approximately 67%, 42% 38% and 55% respectively (Ray DK, 2013). There is an urgent need to search for new sources of feed which contain good amount of protein, fats, amino acids, fatty acids, minerals, vitamins etc. Edible insects are more considerable group of organisms in the world as they have efficient food conversion rate, short lifespan and high nutrient contents. (Oonincx DGAB et al. 2015, Van Der Fels-Klerx HJ et al. 2016). One study revealed that the nutritional quality of edible insects was enough to fight against human malnutrition (Payne CLR, 2016). Insects having enough quantity of crude protein, crude fat and good economic value can replace traditional protein sources required in the food of poultry, aquaculture and other livestock feed products (Makkar HPS et al. 2014, Stamer A., 2015). BSF is appropriate to be used as feed for livestock animals, for cosmetics or pharmaceuticals industries, for biodiesel production and

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10. Impact of Global Economic Recession on Indian Economy: Current Scenario

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Abstract

It is hard to deny, that we are currently in a financial crisis. This is true not just in the United States but in the entire world! Indeed having look at what has been happening in Europe, the United States is not even in the worst shape among the advanced countries. However the United States is the world's largest economy, so our milder economic problems have a larger proportional effect on the rest of the world. As the saying goes among economists, "When the U.S. catches a cold; the rest of the world gets pneumonia!" Therefore there is tremendous pressure on the United States to resolve the current financial crisis

Due to the economic crisis economics world over are considered to be entering into prolonged slowdown in economic activities. The intensity of present economic crisis is so high that is being compared with the global economic recession in 1873, great depression of 1930s and East Asian crisis of 1990s. The current economic slowdown is considered to be sub-prime mortgage crisis in the financial sector of United States. Global economics recession and its impact on Indian economy, in this paper we try to explain the impact of three distinct channels, that is, the capital flows, sectoral contribution and financial sector. The global economic recession has taken its toll on the Indian economy that has led to multi-crore loss in business and export orders, tens of thousands of job losses, especially in key sectors like the IT, automobiles, industry and export-oriented firms.

Indian economy also passed through these stages during the year 2008. The economic growth rate, which was above 8% for consecutive period of three years since 2006, suddenly plunged to an average of 5.5%. Developed world is under the fear that recession may not turn out to be continuous process resulting into great depression. Generally recessions are for two quarters, but depression is a severe economic downturn that lasts several years. Earlier India was affected less by external world depressions as it relied more on internal consumption, saving and import substitutions.

However, after 1991 India opened up its economy to global players, share of exports, both goods and services, in GDP grew significantly.

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Lead free single – double perovskite composite towards room temperature multiferroicity

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HIGHLIGHTS

- Lead free $90BaTiO_3$–$10La_2NiMnO_6$ composite sample was prepared via solid-state sintering route.
- The magnetic Curie temperature (T_c) of the composite was observed near room temperature.
- The dielectric and ferroelectric features of BTO is well maintained in composite at room temperature.
- Multiferroicity (magnetic and ferroelectric order simultaneously) is observed in the proximity of room temperature.

GRAPHICAL ABSTRACT

ARTICLE INFO

Keywords:
Single-double perovskite
Lead free
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ABSTRACT

Lead free $BaTiO_3$-La_2NiMnO_6 (BTO-LNMO) composite sample was prepared via solid-state sintering route. Structural studies based on X-ray diffraction (XRD) patterns indicate BTO and LNMO each retain their respective structure in composite form. Raman spectra of composite inferred no structural modulation after mixing of individual phases of BTO and LNMO. The change in microstructure is observed for composite due to the difference in thermal expansion coefficient as well as the different rate of grain growth of BTO and LNMO phases. BTO-LNMO composite sample is found to be ferromagnetic with non saturation of magnetic moments. Temperature-dependent zero-field cooled (ZFC) and field cooled (FC) curves show large irreversibility (94%) for composite than the pure LNMO phase. The magnetic Curie temperature (T_c) of the composite was observed near room temperature. The dielectric and ferroelectric features of BTO is well maintained in composite at room temperature. This study is an attempt to bring in the multiferroicity (magnetic and ferroelectric order simultaneously) in the proximity of room temperature by incorporating the small percentage of magnetic phase (LNMO) in the ferroelectric (BTO) matrix.

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ORIGINAL PAPER

Optimizing first-, second- and third-order optical traits of zinc tris-thiourea sulphate (ZTS) crystal by L-tyrosine for photonic device applications

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Abstract: Up-gradation of modern era photonic devices encourages modelling of nonlinear optical crystal that embraces excellent linear–nonlinear optical properties. Hence, this is the first effort in the literature to improve the optical performance of zinc tris-thiourea sulphate (ZTS) crystal using L-tyrosine (Ty). The energy-dispersive spectroscopy is used to determine the incorporation of Ty. Single-crystal XRD analysis is employed to determine the structural parameters. The 5% increase in transmittance of ZTS crystal due to Ty has been evaluated by UV–visible study. Kurtz–Perry test confirmed that frequency doubling ability of Ty-ZTS crystal is 1.71 times higher than ZTS. The occurrence of photoluminescence nature has been investigated within visible region. The noticeable change in third-order nonlinear optical refraction (from negative to positive) and absorption (from reverse saturable absorption to saturable absorption) profile of ZTS crystal facilitated due to Ty has been explored. The Z-scan data has been accessed for comparative evaluation of n_2, β and χ^3 of pure and Ty-ZTS crystal. The n_2, β and χ^3 of Ty-ZTS crystal is of order 10^{-8}, 10^{-4}, 10^{-3} while that of ZTS is 10^{-12}, 10^{-4}, 10^{-4}, respectively.

Keywords: Crystal growth; Optical materials; Properties

1. Introduction

The nonlinear optical (NLO) crystals have exclusive demand in optoelectronics, photonics, lasers and optical modulation devices that controls the functioning (partially or wholly) of new technological systems [1]. In the regime of NLO crystals, the thiourea metal complex holds potential statuette as semiorganic crystals contributing unique structural, optical, electrical, mechanical and thermal diversity. Among the numerous crystals, the zinc tris-thiourea sulphate (ZTS) crystal outstands owing to its unique ability to withstand high laser power, superior optical, microscopic and electrical properties [2]. Since ZTS is reported [3] it has been constantly reinvestigated by optimizing growth parameters [4] and doping (organic and inorganic) [5, 6]. The thorough literature analysis on ZTS crystal reveals that the idea of doping an additive paves constructive result [7]. As the primary aim is to develop crystal for photonic devices, we intentionally search for such dopants which can optimize the optical characteristics of ZTS crystals to a large extent. In such a scenario amino acids are realized to have high hyperpolarizabilities. Chiral centres with large donor–acceptor moieties (to facilitate the charge transfer) which empower the NLO attributes of crystal [8]. The appealing factors of this scripted work are

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Article

Dragonflies and damselflies (Odonata: Insecta) of the Seloo city, Wardha, Maharashtra, Central India

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Abstract

Dragonflies and damselflies (Odonata) species diversity was studied in the Seloo city from 2011 to 2021. Its geographical location is 20083'73''N; 78070'70''E; 265 m. A total of 62 species of odonates belonging to 2 Suborders and 8 families were recorded. The highest number of odonates belong to the family Libellulidae (30 species) followed by Coenagrionidae (13 species), Aeshnidae (5 species), Gomphidae (4 species), Platycenemididae (3 species) and Lestidae (4 species), Macromiidae (2 species) and Chlorocyphidae (1 species). Of the total, 30 species were abundant or very common, 16 were common, 6 were not rare, 7 rare and 3 very rare. Among all, 3 species were Data Deficient, *Indothemis carnatica* (Fabricius, 1798) are listed as Near Threatened and 57 were least concern in IUCN red-list of threatened species. The observations support the value of the Seloo city area in providing valuable resources for Odonata.

Keywords Odonata; diversity; Seloo city; Wardha,;Mahrashtra; India.

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1 Introduction

Odonata (damselflies and dragonflies) are very interesting and diverse insects. Odonata are paleopterous, exopterygote aquatic insects, probably more closely related to the Ephemeroptera (mayflies) than any other living insect group. They instantly attract attention with their amazing flight skills and beautiful colours. Odonate is prominent freshwater insects and plays an important role in wetland and terrestrial food chains as predators. The adults are generally predacious insects, while the larvae are carnivores and voracious feeders. They are also actively used in controlling causative agent of malaria and filaria throughout the world (Tiple et al., 2008). Even though species are usually highly specific to a habitat, some have adapted to urbanization and use man-made water bodies. They probably mark the first time that evolution experimented with the ability to hover in air over an object of interest. Being primarily aquatic, their life history is closely linked to specific aquatic habitats. Naturally, these insects become a marker, an indicator of wetland health (Andrew et al., 2008).

Dragonflies mostly occur in the vicinity of different fresh water habitats like rivers, streams, marshes, lakes

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COMMUNICATION

Dragonflies and damselflies (Insecta: Odonata) of Jabalpur, Madhya Pradesh, India

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Abstract: The present study was carried out to reveal the odonate diversity in Jabalpur city and its surrounding area in Madhya Pradesh, central India. During the study period of 2008–2019 a total of 75 species of odonates belonging to two suborders and nine families were recorded. Twenty-one new species were recorded for Jabalpur district and four for Madhya Pradesh. 37% (28) species were abundant or very common, 19% (14) were common, 16% (12) were frequent, 24% (18) rare, and 4% (3) very rare. The maximum number of odonates were found in family Libellulidae (n= 32), followed by Coenagrionidae (n= 17), Gomphidae (n= 09), Platycnemididae (n= 06), Aeshnidae (n= 05), Lestidae (n= 03), Macromiidae (n= 02), and Chlorocyphidae (n= 01). Of 75 species recorded from Jabalpur city, 72 come under the IUCN Red List. Among them, *Indothemis carnatica* come under Near Threatened (NT) category, 65 species come under Least Concern (LC) Category, six species under Data Deficient (DD), and three species remain not assessed. The study supports the value of the city area in providing habitat for Odonata.

Keywords: Central India, checklist, conservation, distributional gaps, diversity, habitat, IUCN Red List, new records, Odonata.

सारांश: प्रस्तुत अध्ययन मध्य प्रदेश के जबलपुर शहर और इसके आसपास के क्षेत्र में ओडोनेट विविधता को प्रकट करने के लिए किया गया था। 2008-2019 की अध्ययन अवधि के दौरान दो उपवर्गों और नौ परिवारों से संबंधित ओडोनेटा की कुल 75 प्रजातियों को दर्ज किया गया था। जबलपुर जिले के लिए इक्कीस नई प्रजातियां दर्ज की गई और मध्य प्रदेश के लिए चार नई प्रजातियां दर्ज की गईं। 37% (28) प्रजातियां प्रचुर या बहुत आम थीं। 19% (14) आम थीं, 16% (12) बारंबार दिखाई देने वाली, 24% (18) दुर्लभ और 4% (3) बहुत दुर्लभ थीं। ओडोनेट्स की अधिकतम संख्या वाली नई नई प्रजाति लिबेलुलिडे (n= 32) परिवार में पाई गई थी, इसके बाद कोएनाग्रिओनिडे (n= 17), गोम्फिडे (n= 09), प्लेटिसेनेमिडिडे (n= 06), एशनिडे (n= 05), लेस्टिडे (n= 03), मैक्रोमिडिडे (n= 02), और क्लोरोसाइफिडे (n= 01) की प्रजातियां आती हैं। जबलपुर शहर से दर्ज 75 प्रजातियों में से 72 प्रजातियां IUCN रेड लिस्ट के अंतर्गत आती हैं। इनमें से इंडोथेमिस कार्नाटिका निकट खतरे (एनटी) श्रेणी के अंतर्गत आती हैं। 65 प्रजातियां न्यूनतम चिंता श्रेणी (एलसी) श्रेणी के अंतर्गत आती हैं। छह प्रजातियां डेटा की कमी (डीडी) श्रेणी के अंतर्गत आती हैं और तीन प्रजातियों का मूल्यांकन नहीं किया जाता है। अध्ययन ओडोनाटा के लिए आवास प्रदान करने की शहर के क्षेत्र के महत्व का समर्थन करता है।

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Competing interests: The authors declare no competing interests.

Author details: Dr. Ashish D. Tiple is a wildlife biologist with field experience in Central India. He has more than 18 years of research experience. His prime research focuses on Butterfly biodiversity; taxonomy; behavior; population dynamics; molecular ecology and insect tissue culture; In addition, he is also a keen Odonatologist, interested in dragonfly diversity and behavior. He also maintains an active interest in Conservation at the grassroots level with respect to bureaucracy, community involvement and related activities. He has 70 International/ National papers, 09 books and 1 ebook in his credit on an extensive range of ecological, behavioral and biogeographically research of central Indian fauna. Vivek Sharma is actively working on snakes of India and has been part of 20 publications on snakes. His aim is to innovate and build bridges to facilitate citizen-science projects on wildlife and environment. Presently he is working as a freelance biologist to provide solutions on the education of snakes and snakebites and occasionally shows his interest in wild mammals and the Odonate diversity of central India. Sonali V. Padwad is involved in extensive research in the field of Biotechnology and insect ecology. She has 14+ years of research and teaching experience and published 12 research papers in reputed journals. In addition, she is also interested in dragonfly and Butterfly diversity and behavior.

Author contributions: ADT and SVP designed the study, carried out the fieldwork, analyzed the data and prepared a draft. VS carried out the fieldwork and revised the final draft. ADT, SVP and VS helped with the preparation of the manuscript and revised the draft.

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Original Research Article

Phytochemical Analysis and Antimicrobial Activity of Mimordica Charantia Medicinal Plant Against Selected Common Human Pathogenic Microorganisms

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Abstract: *Momordica charantia* is a plant belonging to Cucurbitaceae family known for decades for its medicinal and nutritional value. The objective of the present study was to do qualitative evaluation and compare the antibacterial activity of *M. charantia leaf*, seeds and fruits. Results of our study showed that hybrid seed methanol extract had more active phytoconstituents like alkaloid, carbohydrate, saponin, proteins, resin, flavonoid, diterpens, reducing sugars than other extracts of fruit, leaf and seed of wild and hybrid varieties of *M. charantia* extracted using different solvents. Carbohydrate, phytosterol, and proteins are mostly present in all extracts of *Mimordica charantia*. Flavonoids are significantly present in seeds. So hybrid seed methanol extract can be considered as the main source of above mentioned phytochemicals to facilitate pharmaceutical industries. Methanol extracts of hybrid seed exhibited highest zone of inhibition against *Salmonella paratyphi A* (30±0.64mm) & *Staphylococcus aureus* (26±0mm) and chloroform extract of wild fruit showed highest activity against *E.coli* (22.5±0.64mm).Hence these extracts may be used to treat infectious diseases, surgical wounds, skin lesions, salmonellosis, enteric fever, food poisoning. The purpose of the current study was to investigate antimicrobial activity of M. *charantia, apart* from being used as anti-psoriatic drugs and this plant earlier have been used also as antibacterial agents, hence the activity was also carried out against other organisms such as *Escherichia coli, Staphylococcus aureus, Bacillus subtilis, Salmonella typhi* and *Aspergillus niger*. Further phytochemical analysis (using techniques like TLC and HPLC) will be necessary to isolate the active constituents and clinical studies are required to understand the mechanism and the actual efficacy of these extracts in treating various infections and skin diseases. This will have significant importance in pharmaceutical and herbal industries.

Keywords: *Momordica charantia*is, Phytochemicals, Flavonoids, *Salmonella, Cucurbitaceae.*

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An updated list of butterfly (Lepidoptera, Rhopalocera) fauna of Tadoba National Park, Chandrapur, Maharashtra, Central India

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ABSTRACT. The present study was carried out to reveal the checklist of butterfly species in the Tadoba National Park, Chandrapur area of 623 sq. km. Study was carried out from 2011 to 2021. A total of 134 species were recorded, with an addition of 27 new records for Tadoba National Park. Of the total, 60 species were very common, 34 species were common, 9 were frequent common, 19 were rare, and 12 were very rare. Most of the butterflies recorded belong to the Nymphalidae (43 species) with 4 new records. Of Lycaenidae, 41 species with 12 new records. In Pieridae 19 species with 3 new records were recorded. A total of 20 Hesperiidae species with 6 new records and 10 species were recorded from the Papilionidae with 2 new records and one species recorded from the family Riodinidae. About 12 species of the recorded ones come under the protection category of the Indian Wild Life protection Act 1972. The study provided an updated list of butterflies of Tadoba National Park.

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INTRODUCTION

Butterflies are generally regarded as one of the best taxonomically studied groups of insects (Robbins & Opler, 1997), yet even in genera containing very common and widespread species, our understanding of true species diversity may prove to be startlingly below common expectation (Achery, 1987; Willmott et al., 2001). Butterflies have been studied systematically since the early 18th century and about 18,000 species are documented worldwide (Martinez et al., 2003). Insects have been shown to be sensitive to changes in vegetation composition and the physical attributes of the environment (Gardner et al., 1995; Wood & Gillman, 1998) resulting in a decrease in insect diversity (Holloway, 1987; Holloway et al., 1992). Among insects, butterflies are the most beautiful and colourful creatures on the earth and have a great aesthetic value, which makes them very attractive. Butterflies are very important for pollination as they visit different flowers for nectar feeding, which makes them an important unit of the environment (Tiple et al., 2006). Besides, they form an important part of the food chain of birds, reptiles, amphibians, spiders and predatory insects; transforming and transmitting energy from green

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Ehretia laevis leaves: Potential herbal remedy for mouth microflora

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The advantages and uses of folklore herbs have been acclaimed and executed from ancient times in India. The use of these Folklore remedial herbs for therapeutic applications is contributing to maintenance of human health. The ancient literature, i.e., Ayurveda and Unani, also describes the global usage of herbal medicine for treatment, and its formulation's concoction for prevention of various diseases. *Ehretia laevis* is a conventional therapeutic herb from ancient times, frequently designated as Khandu Chakka by local people in Maharashtra. *E. laevis* leaves are used in the treatment of skin infections, fungal infections, mouth blisters, eczema, cuts and wounds, diabetes, asthma, fever and joint pain etc. The leaf of this plant contains abundant therapeutically beneficial secondary metabolites besides primary metabolites.

This paper describes antimicrobial sensitivity of *E. laevis* leaf (fresh and dried) acetone and ethyl alcohol (95%) soxhlet extract and dried leaf dimethyl sulphoxide (DMSO) extract (prepared after from evaporation of acetone in dried leaf acetone extract) against isolated oral microbial flora i.e., *Streptococcus* spp. *Staphylococcus aureus* and *Candida* spp. Amoxicillin in dimethyl sulphoxide was also tested for antimicrobial sensitivity. The result revealed that *E. laevis* fresh leaf ethyl alcohol and acetone extract and dried leaf acetone and DMSO extract was efficacious against isolated oral microbial flora. The extracts showed positive results for flavonoids and tannins. The results showed the antibacterial and antifungal potential of this folklore plant, particularly against *S. aureus* and *Candida* spp., which are microorganisms that are becoming resistant against most therapeutic drugs. This use of this folklore herb requires further study on pharmacological drug formulations. And it can also be used in herbal products i.e., toothpastes, mouthwash etc.

Keywords: Antimicrobial activity, *Candida* spp, *Ehretia laevis*, Phytochemical, *Streptococcus* spp, *Staphylococcus aureus*
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For thousands of years folklore therapies have been comprehensive healing preventive traditional system used for nurturing the health of human beings[1]. In India, conventional remedial treatment is the basis of several methodologies i.e., Ayurveda, Siddha and Unani[2]. To encourage the correct use of herbal therapy, and to find out their prospective for sources of new medicine, it is crucial to investigate medicinal plants which have folklore recognition in a more intensified way[3-8].

Ehretia laevis is a medium height flourishing herb belonging to the family Boraginaceous that includes approximately 150 species[9]. This herb is primarily dispersed all around tropical and subtropical regions of Asia, Africa and Australia[10]. This plant is used from ancient period and has many medicinally useful chemicals components[11]. In India, in Wardha taluka (District Maharashtra), *Ehretia laevis* Roxb. herb is used by tribals to heal injuries and fractures, often known as Khandu Chakka[11]. In ancient literature of Ayurveda and Unani, this herb is reported for its medicinal value to treat respiratory ailment, as well as to treat jaundice, ulcers, liver diseases, diabetes mellitus, and microbial infections i.e., syphilis, toothache, stomach and venereal diseases[12]. Li *et al.* reported the presence of phenolic acids, flavonoids, triterpenoids, steroids etc. in the genus *Ehretia* with antimicrobial, antidiabetic and anti-inflammatory activities[13].

Salivary microorganisms are mainly responsible for oral health problems i.e., caries[14], which disturbs the normal microflora in the mouth cavities[15]. In the remote areas of Pakistan and Rajasthan, *E. lavies* are used for dental caries and mouth ulcers, respectively,[16,17]. There are reports regarding antimicrobial activity of *E. lavies* extracts against *Staphylococcus aureus, Pseudomonas aeruginosa, Bacillus subtilis* and *Escherichia coli* using ethanol, chloroform and water-based solvents[18-21]. In one of the studies on *E. laevis* leaves, acetone extract was studied against *P. aeruginosa, E. coli and S. aureus*[22,23]. It is reported that the methanolic and

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Case Report

Young patient's chronic fever

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Keywords: Typhoid fever, bacteria, weakness, ayurvedic medicines, home remedies.

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Abstract

Typhoid is one of the important diseases that are responsible for human suffering. The presented case report includes a health issue story of a boy who confronted various stages of his life in relation with a disease. He takes the treatment to his tyhoid disease but not completes it and ignores the prescription by the medical officer. He takes the medicines as per his own decision and suffers more. Ultimately, the study suggests that the medicines against the concerned disease should be preferred by the patients as per the instructions by doctors and not by their own preventing health hazards.

Typhoid fever is an infectious serious infection marked by intestinal inflammation and ulceration. This is an important public health problem in developing countries caused by the bacterium *Salmonella typhimurium* and *Salmonella paratyphi* [1]. First, bacteria enter the intestinal tissue without symptoms for 2 weeks. Then, these, soon invade the bloodstream, often taking 10 days and causing a high fever. Finally, the bacteria are localized in the gallbladder and surrounding organs and cause lesions. The major symptoms of typhoid are fever, rash, weakness, abdominal pain, constipation, and headaches. Typhoid fever is particularly high; gradually increasing over several days up to 39 to 40 °C. Now, it's a typical appearance is seen in the tropics. In this case report, a case of 21 years male suffered from typhoid fever has been reported.

A twenty-one years old male student in B.Sc. final year from Taluka Girad (Samudrapur), District Wardha, Maharashtra, India came to the Wardha district to complete his Diploma course in Medical Laboratory Technology in 2018. At that time, his health was good in condition. After near about one and half years, he suffered from mild fever for up to 4-5 months. He went to Dr. Jaychand Moon, Medical Officer and family physician in Wardha for treatment. The doctor prescribed Cefuroxime and cough medicines and some blood tests. The fees of the doctor were not affordable to the patient, so he avoided taking the medical test. The medication from the doctor felt him better.

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Effect of locally generated food waste on bioconversion and nutrient parameters of black soldier fly larvae, *Hermetia illucens* L.

Ganvir KP, Darvekar AN, Raut VD and Thorat RK

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Abstract
Black soldier fly larvae (BSFL) are well known for its high digestibility to reduce any type of organic waste, including fruits, vegetables, farm waste, municipal wastes etc. Appropriate BSF farming methodology not only can generate enough income to the farmers, but reduces environmental pollution which leads to sustainable development. In developing countries, in urban as well as rural areas early perishable fruits like banana, papaya, muskmelon, watermelon and vegetables undergo wastes if not properly handled and stored. In these areas expired floor and bakery wastes are also common. For this study BSF larvae were fed on waste separately to explore the effect of locally available organic wastes as feed for the production of black soldier fly larvae. BSF larvae were fed separately on Waste Summer Fruits (WSF), Waste Papaya (WP), Waste Banana (WB), Waste Vegetables (WV), Bakery Waste (BW) and on Kitchen waste (KW). The efficiency of BSF larvae to consume these locally generated wastes and therefore reduce the waste loads of different substrates was studied. Various bioconversion parameters were evaluated, like feed consumed, Total larval yield, survival%, larval growth %, total waste reduction %, bioconversion % and feed conversion rate (FCR). BSF converts waste into biomass so the nutrient parameters like crude protein, lipid and amino acid composition were also analysed. From this study BSF larvae are proved to be a potential insect to reduce these organic wastes efficiently, but may be because of BSF larvae were fed continuously on the same type of food waste, the nutrients like protein, fats and amino acids in BSF found to be very low. This study concluded that for commercialization, it is essential to feed BSF larvae on mixed types of food waste rather than only on single type of waste.

Keywords: Organic waste management, feed conversion rate, waste reduction, biomass, larval growth percent

Introduction
Today number of developing countries are facing waste disposal and dumping problems as the landfills are already occupied with garbage, reaching their capacity, reducing the available space for future waste disposal, which will create a need to occupy the new lands. It was estimated that approximately one third of the food produced for human consumption get lost as wastage globally each year (FAO, 2019) (Gustavsson *et al.*, 2020) [17]. Food waste harms the environment in multiple ways and leads to loss of finite resources such as land, water and fuel utilised during food production and distribution. Not only this but food waste in landfills is contributor to climate change, contributes 4.4 gigatons of carbon dioxide (CO_2) in the atmosphere annually as well as emits Green House Gas (methane) (Scialabba *et al.*, 2013) [33]. Sustainable methods for recycling wastes can reduce this problem as the valuable components of the wastes will be utilised.

World will face hunger when the population will increase at its extreme and the natural resources will be limited for the production of food. To reduce, recycle and reuse will be the motive for our survival in future. Now it's time to use each and every part of our food, produced by our hard work in limited natural resources. Food and other organic wastes are a valuable resource that everyone should not waste as it contains a lot of nutrients and energy value that could be beneficial to both humans and the environment if reintegrated into the value chain (Bloukounon *et al.*, 2017) [4].

Black soldier fly (BSF) organic waste management technology is the key to reduce the organic waste generated by us which will be consumed by these insects, so the nutrients present in the

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Research Article

An initial checklist of the ants (Hymenoptera: Formicidae) and their specific distribution from district Wardha, Maharashtra, India

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Abstract

Biodiversity of life forms is incredible in India. In the present study, the comprehensive list of ant species and their distribution in district wardha from 2019 to 2021 have been studied. The habitat selected to study the impressive diversity of ants is agricultural field, domestic habitats, tree plantations, and surrounding water bodies. This is the first checklist of ant recorded in eight tehsil places (Seloo, Wardha, Deoli, Arvi, Ashti, Karanja, Hinganghat, Samudrapur) of district Wardha. The total ant species recorded belong to six subfamilies i.e. Formicinae, Myrmicinae, Ponerinae, Dorylinae, Dolichoderinae, and Pseudomyrmicinae. A total of 57 species belonging to the 30 genera are listed in the district. The species diversity index is more in agricultural fields followed by domestic habitats. The generic richness recorded for *Componotus* and *Crematogaster*.

Keywords Ants, Checklist, Distribution, Habitat, Wardha.

Introduction

The Vidarbha region is well known for its varied habitat and niche, seasonal environment, and interesting biodiversity. Wardha district is part of vidarbha. The ant behaviour is eusocial (Gadagkar et al., 1993). Ants are cosmopolitan, an important part of animal biomass, and present at almost all levels of the terrestrial food web (Holldobler and Wilson 1990; Andersen, 1997; Pfeiffer et al., 2013). There are 12 known subfamilies of Indian ants i.e. Dolichoderinae, Dorylinae, Myrmicinae, Ponerinae, Formicinae, Pseudomyrmecinae, Aenictinae, Amblyoponinae, Cerapachyinae, Ectatomminae, Proceratiinae, and Leptanillinae. With predatory behavior, ants also perform the role of scavengers, pollinators, and nutrient cyclers (Del et al., 2012; Guenard 2013) and contribute to the dispersal behavior of plants (Lach et al., 2010).

The first checklist of Indian ants was published by Chapman and Capco, (1951). However, Jerdon (1851, 1854) published the catalog of Southern Indian ants. His list was extended by Forel (1900, 1901) and added 267 species to the previous list. The latter compilation of the checklist was done and recorded 652 valid species (Bharti, H. 2011). The diversity of Indian ants and their state-wise distribution is given and recorded in 828 species and 100 genera grouped in 10 subfamilies (Bharti et al., 2016). However, number of species for invertebrate groups have to be documented in catalogue. Distribution of ant species in and around Amravati city of Maharashtra recored 34 species in 20 genera (Chavan and Pawar, 2011). Distribution of ant fauna in and around Nagpur city, Maharashtra recorded 25 genera belonging to five subfamilies (Meshram et al., 2015). Distribution and diversity of ants around Gautala Autramghat Sanctuary, Aurangabad Maharashtra recorded total of 17 species of ants belonging to 13 genera and 6 subfamilies (Sonune and Chavan, 2016).

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Sustainable Development Through Decent Jobs for Youth

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Abstract:
This paper discusses that it is time for environmental economists to convey the service impressions of justifiable progress strategies to the front position of the investigation programme. Significant management determinations endure to organizer because of their apparent service possessions. The paper studies the evidence on the employment impressions of sustainable development policies andcontends that preserving or even cumulative employment be subject to critical policies design and consideration to the political budget of application of policies. The paper accomplishes that a recovered thoughtfulness of these questions, reasonable labor marketplace and organizational modification programs, and particularly frontward development to expect problematic extents, mustsubstitute the disconnected, 'knee–jerk' responses to ecological issues.

***Keywords**: Sustainable Development, management, marketplace, unemployment*

Introduction:
At present, India is the second fastest growing economy in the world and the second most populouscountry in the world. The specialty of Indian population is that the world's youngest population is in India. Today the same youth power is forced to wander from door to door for a job. The bitter truth is that due to rising unemployment, the stigma of most suicides is also onthe forehead of our country. According to the latest figures of the National Crime Records Bureau, every day 26 youths are Suicide them self & end their life. Today India is making rapid progress in all fields. Unemployment is increasing in India and there are a large number of educated youth in it and this problem is increasing day by day. The important reason for the increase in the number of educated unemployed is that government jobs are not available in thenumber of educated people coming out with their degrees. Due to this the number of educated unemployed is increasing day by day. According to a report by the Center for Monitoring Indian Economy, (CMIE) India's unemployment rate has risen to 6.23 percent by the end of March 2016. Unemployment is also relatively high in urban areas. Presently, there are about 31 million youth unemployed in the country and the number of job creation in the country is more than 6 lakh per annum and the number of graduates leaving the country at the end of the academic year is increasing every year. The main objective of this observation is to observe the problemof increasing unemployment in India.

The rising unemployment of educated people in India has become the hallmark of theIndian economy. As a result of decades is all types, of unemployment growth, (highly skilledand unskilled) is increasing rapidly today. In this situation there are not only unemployment problem of highly educated youth, but less educated and unskilled youth also. Rising unemployment is a serious problem for every country. For India, however, the unemployment picture is grim. Therefore, there is a need to seriously

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The linkage between the second wave of COVID-19 and the severity of mucormycosis in India

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Mucormycosis, COVID-19, diabetes, immunosuppression, second wave of SARS-CoV-2

ABSTRACT

The whole world was fighting the danger of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) since 2019. The SARS-CoV-2 virus was mutating with great speed, and putting new challenges in front of the world. In India, the whole healthcare system was engaged in tackling the second wave of COVID-19 as a result of virus mutation. Additionally, a fungal co-infection, mucormycosis started to invade the COVID-19 patients. Mucormycosis is an acute infection, caused by an opportunistic fungus, mostly attacks the immunosuppressed, diabetic, and neutropenia patients. The other causes of infection include inappropriate use of immunosuppressive drugs, entry of *Mucorales* through open wounds, cancer, acquired immune deficiency syndrome, organ transplant, and malnutrition. In the recent mucormycosis outbreak in India, all the mucormycosis cases included eyesight damage, facial deformities, and even death in critical conditions. These reported mucormycosis cases in India were mostly diabetes, which were treated with immunosuppressive drugs. The mucormycosis fungus was probably invading the recovered, or near to recovery the second wave COVID-19 patients. In this review, we discussed the important risk factors responsible for the sudden outbreak of mucormycosis, and its severity linked to second wave COVID-19 patients in India.

1. INTRODUCTION

In entire India, COVID-19 cases due to double mutant severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) virus were jumping up in an uncontrolled manner, and the country was also imagining the fear of third COVID-19 wave. In inclusion to these calamities, India was also facing the rising cases of COVID-19 linked mysterious infection "mucormycosis" creating significantly more complications in COVID-19 patients [1–7].

In the year 2021, during the second wave of COVID-19 (SWCOVID-19), 10–100 number of the COVID-19 patients in India were getting infected with fungal co-infection mucormycosis, causing eye damage, facial deformities, blindness, and further death in severe conditions like diabetes [8–10]. News media reported the various cases of mucormycosis among the SWCOVID-19 patients from Pune, Gujarat, Ahmedabad, Madhya Pradesh, Odisha, Karnataka, Uttarakhand, Telangana, Madhya Pradesh, and Bihar [11,12]. With this inclusion, total number of cases was rising continuously in India [13–20] (Table 1).

Mucormycosis is an acute angio-invasive infection [21–23] causing embolism and death of tissues [24,25]. In most of the cases, the infection progresses as a nosocomial infection [26–34]. Mucormycosis fungus enters inside the body through environmental routes by inhalation [35–38] and captures the broad range of immunologically compromised, and immunocompetent traumatic wound patients [39–41]. Mucormycosis is caused by a group of opportunistic mold "mucoromycetes" [42], belonging

Table 1: Rising mucormycosis cases in India during the second wave of COVID-19 diseases.

Date	Number of mucormycosis cases
May-21-2021	8,848
May-26-2021	11,717
May-28-2021	14,872
June-07-2021	28,252

Source of data [16–18,20].

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Research Article

Phytochemical Screening of Some Important Medicinal Plants Used for Kidney Stone

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ABSTRACT

Phytochemicals are bioactive compounds obtained from the *Solanum xanthocarpum, Bryophyllum Pinnatum, Tridex procumbence* and *Phyllanthus emblica* plant are widely applied in the traditional herbal medicine. These four plants were collected from local nursery located in Katol taluka of Maharashtra, India. These plants are being used for the treatment of kidney stones disease in and around the region. The parts of plants are shade dried for seven to fifteen days. A fine powder has been prepared of dried leaves, stem and root. Phytochemical analysis is carried in aqueous and methanol extracts. It shows the presence of Alkaloids, Tannins, Saponins, Protein, Steroids, Quinones etc. in these extracts. Thin Layer Chromatography study constituted different colored phytochemical compounds with different Rf values. These four plants contain many active phytochemicals. It can be further investigated for the isolation and identification of active biochemical compound

Keywords: biochemical compound, Medicinal plants, Kidney stone.

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INTRODUCTION

Phytochemicals are bioactive compounds obtained from the plants and are widely applied in the traditional herbal medicine. These herbal medicines are being used by the local people to cure the various diseases which include the major diseases such as kidney stone, Diabetes mellitus, Cancer, HIV etc. For thousands of years the nature is the best origin for the traditional agents[1]. About 20% of known plants have been used in pharmaceutical drug discovery and study their effectiveness of the bioactive compounds on the health care system such as harmful chronic diseases, cancer and kidney stone. Natural products have been used for the treatment of numerous human diseases for a long period of time. Recently, there has been a growing interest in natural occurring plant products as alternatives to synthetic medicines considered as unsafe to humans and environment[2-3].

Tridax procumbens belong to family Asteraceae. It is best known as a widespread weed and pest plant. It has been in use in India for wound healing and as an anticoagulant, antifungal, and insect repellent. It is used in Ayurvedic medicine for liver disorders and kidney stone disease[4].*Bryophyllum pinnatum* belongs to the family Crassulaceae and the common names include life plant, love plant, miracle leaf and Canterbury bells. It is a succulent plant, 50 – 200 cm tall and about 3.2 cm wide, and reproduces via seeds and also vegetatively from leaf bulbils[5-6]. *Solanum xanthocarpum* belongs to the family Solanaceae. It is an annual herbaceous plant. It is commonly called Kantkari. It is useful in treating worms, cough, hoarseness of voice, fever, painful urination, enlargement of the liver, muscular pain, and stone in the urinary bladder[7]. *Phyllanthus emblica* belong to family Phyllanthaceae. It is also known as emblic, emblic myrobalan, myrobalan, Indian gooseberry, Malacca tree, or amla, in Sanskrit amalaki. It is a deciduous tree plant. It has been used in Ayurveda and its major constituent is vitamin C which has effective free radical scavenging property[8].

MATERIALS AND METHODS

Tridex procumbence, Solanum xanthocarpum, Phyllanthus emblica and Bryophyllum pinnatum plant were collected from local nursery located in Katol tahsil of Maharashtra state, India. The whole plants were collected and washed carefully under running water and then with sterilized distilled water. Then the plants were dried under the shade for seven to fifteen days. The different part of the plant such as fresh leaves, stem and root were homogenized to a fine coarse powder using mortar and pestle separately and then stored in fine air tight container for further process.

Preparation of leaves, stem and root extracts

Preparation of leaves, stem and root powder was carried out of *T. procumbence, S. xanthocarpum, P. emblica* and *B.*

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An Analytical Study About Consumer Behavior with Special Reference to Electronics Durable Goods in Nagpur Region

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Abstract: *Consumer behaviour is the most important aspect of the market. Nagpur region has around 25 lacs population the market is also very big. To study consumer behavior, we first need the look at the aspect of the market. The Indian appliances and consumer electronics industry stood at US$ 9.84 billion in 2021 and is expected to more than double to reach Rs. 1.48 lakh crore (US$ 21.19 billion) by 2025. Electronics hardware production in the country stood at US$ 63.39 billion in 2021. So, the market is very big nowadays and it still increasing in the future. This research article deals with the market and consumer behavior. Consumer behavior and decision-making have evolved and become key issues in the marketing world. This white paper provides a comprehensive overview of consumer behavior in marketing and the factors that influence their purchasing decision process.*

1. Introduction

Understanding consumer behavior is a key element of a marketing strategy. In fact, before implementing a strategy, it is essential to fully understand the needs and expectations of the consumers you want to influence. To do this, you need to understand how the consumer will react and be influenced by your marketing strategies.[1] Many authors given theories on consumer behavior some are as follows According to Engel, Blackwell, and Mansard, "consumer behavior is the actions and decision processes of people who purchase goods and services for personal consumption" [2] According to Louden and Bitta, "consumer behavior is the decision process and physical activity, which individuals engage in when evaluating, acquiring, using or disposing of goods and services" [3] so both definition tells us that there is a process of consumer behavior which is need recognition, search alternative, evaluation alternatives, purchase, and post-purchase evaluation.

Figure. 1

Need Recognition

This is the first stage of the purchasing process. Consumers do not buy without recognizing their needs and want. Consumers make purchase decisions when they feel the need to purchase a particular product. You have a need or problem that can be solved by

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