



RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur

(Affiliated to University of Gour Banga, Malda)

Recognized by UGC U/S 2f & 12(B)

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CRITERION 3

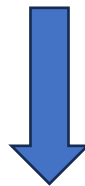
Research, Innovations and Extensions

3.3 Research Publications and Awards

Documentation w.r.t. 3.3.1 Number of research papers published per teacher in the Journals notified on UGC website during the last five years

DOCUMENTS

Link to the uploaded papers, the first page/full paper (detailing with author, affiliation and publication details) on the institutional website



<http://rsmraiganj.in/wp-content/uploads/2024/08/3.3.1-Research-Paper-Published-in-Last-Five-Years.pdf>

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Sl. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1	The Bengal Bargadars Temporary Regulation Bill, 1947: An Antagonist of the Tebhaga Movement	Chandana Saha	History	International Journal of Research and Analytical Review (IJRAR)	2023	2348-1269	http://www.ijrar.org	https://acrobat.adobe.com/id/urn:aaid:sc:AP:eee02179-385e-4194-b226-35e47f49724d	Yes
2	A study of solitons on para Sasakian manifolds with respect to a metric connection	Abhijit Mandal, Meghla Mallik, Gopansaha	Mathematics	Journal of Advance Mathematical Studies	2023	2065-5851	https://www.journal.fairpartners.ro/editorial-board/5.htm	https://www.researchgate.net/publication/373485060_A_STUDY_OF_SOLITONS_ON_PARA-SASAKIAN_MANIFOLDS_WITH_RESPECT_TO_A_METRIC_CONNECTION	Yes
3	Microwave-assisted synthesis of indolizine derivatives: Recent developments: A review (2003-present) 505-525	Sujit Ghosh and Kinkar Biswas	Chemistry	Synthetic Communication	2023	1532-2432	https://www.tandfonline.com/journals/lsyc20	https://shorturl.at/cAGMN	Yes, Scopus Indexed


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4	তারাশঙ্করর 'কবি' : পুনর্বিচিনা	Shimul Chandra Sarker	Bengali	Trisangam International Refereed Journal (TIRJ)	2023	2583 - 0848	TIRJ – Trisangam International Refereed Journal	https://acrobat.adobe.com/id/urn:aaid:sc:AP:4b368caf-17e3-49a8-8785-c6ce94db8f93	Yes
5	High-spin states of 204 At: isomeric states and shears band structure	D. Kanjilal, S. K. Dey, S. S. Bhattacharjee, A. Bisoi, M. Das, C. C. Dey, S. Nag, R. Palit, S. Ray, S. Saha, J. Sethi and S. Saha	Physics	The European Physical Journal A (EPJ A)	2022	1434-6001	https://link.springer.com/journal/10050	https://acrobat.adobe.com/id/urn:aaid:sc:AP:37a9cd37-94d5-410e-8799-c83da62958e2	Yes, Scopus Indexed Journal


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6	Left Alternative and Industrialization in West Bengal: 1977 – 1987	Dr. Abhinandan Das	History	Proceedings of the Indian History Congress, Vol. 80, New Delhi	2022	2249-1937	https://www.jstor.org/stable/27192850	https://www.jstor.org/stable/27192976	Yes
7	Cananginone Abrogates EMT in Breast Cancer Cells through Hedgehog Signaling.	C. Bose, U. Das, T. K. Kuilya, J. Mondal, J. Bhadra, P. Banerjee , R. K. Goswami, S. Sinha	Zoology	Chemistry and Biodiversity	2022	1612-1880	https://onlinelibrary.wiley.com/doi/10.1002/cbdv.202100823	https://doi.org/10.1002/cbdv.202100823	Yes, Scopus Indexed Journal
8	Ricci soliton on Sasakian manifolds admitting Zamkovoy connection	Abhijit Mandal , Afsar Hossain Sarkar and Ashoke Das and	Mathematics	Italian Journal Of Pure And Applied Mathematics	2022	2239-0227	https://ores.su/en/journals/italian-journal-of-pure-and-applied-mathematics/	https://acrobat.adobe.com/id/urn:aa-id:sc:AP:cecdbe53-8d30-41a4-8f77-13773a25f755	Yes

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9	ZAMKOVY CONNECTION ON LORENTZIAN PARAKENMOTSU MANIFOLDS	Abhijit Mandal, Afsar Hossain Sarkar and Ashoke Das and	Mathematics	Bulletin of Calcutta Mathematical Society	2022	0008-0659	https://archive.org/details/dli.calcutta.11603/page/98/mode/2up	https://acrobat.adobe.com/id/urn:aa:id:sc:AP:c66b089a-5d5a-4dfc-91aa-f9c898227644	Yes
10	SOME CURVATURE PROPERTIES AND RICCI SOLITON ON SASAKIAN MANIFOLD ADMITTING A METRIC CONNECTION	Abhijit Mandal, Gopan Saha and Ashoke Das and	Mathematics	Journal of Advance Mathematical Studies	2022	2065-3506	https://www.journal.fairpartners.ro/editorial-board_5.htm	https://acrobat.adobe.com/id/urn:aa:id:sc:AP:aeaf6482-8986-49b6-a7c8-b52f3e52147d	Yes
11	Contradiction and Negotiation: New Economic Policy and Industrial Policy Transition in West Bengal, 1987 – 2000	Dr. Abhinandan Das	History	Karatoya, Department of History Journal, University of North Bengal	2022	2229-4880	https://karatoya.nbu.ac.in/	https://ir.nbu.ac.in/handle/123456789/5102	Yes


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12	SOME CURVATURE PROPERTIES OF PARA-KENMOTSU MANIFOLD WITH RESPECT TO ZAMKOVY CONNECTION	Abhijit Mandal , Afsar Hossain Sarkar, Ashis Biswas, and Ashoke Das and	Mathematics	Journal of Hyperstructures	2022	2322-1666	https://jhs.u ma.ac.ir/	https://acrobat.adobe.com/id/urn:aaid:sc:AP:438539b6-4df1-4d38-8e14-58da0f202beb	Yes
13	An Examination of Implementation of Whistle-blowing Policies in Organizations	Dr. Shuvendu Dey & Subrata Ghosh	Economics	SIT Journal of Management	2021	2278-9111	https://portal.issn.org/source/ISSN/2278-9111	https://acrobat.adobe.com/id/urn:aaid:sc:AP:c82830b1-84d8-4ce4-af8c-9ad2bc1fd80d	Yes
14	On Pseudo-Projective Curvature Tensor Of Sasakian Manifold Admitting Zamkovy Connection	Abhijit Mandal , Ashoke Das	Mathematics	Journal of Hyperstructures	2021	2322-1666	https://jhs.u ma.ac.ir/	https://acrobat.adobe.com/id/urn:aaid:sc:AP:38bd273f-469b-4d3c-9ac4-0f3d3ae13c80	Yes, Scopus Indexed Journal


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15	Effector functions of Th17 cells are regulated by IL-35 and TGF- β in visceral leishmaniasis	Mohammad Asad, Abdus Sabur , Mohd Kamran, Md Shadab, Sonali Das, Nahid Ali	Botany	Faseb Journal	2021	1530-6860	https://faseb.onlinelibrary.wiley.com/journal/15306860	https://acrobat.adobe.com/id/urn:aaid:sc:AP:734c590f-341c-4be7-92cb-84346b3deebf	Yes, Scopus Indexed Journal
16	Zamkovoy connection on Lorentzian para-Sasakian manifolds	Abhijit Mandal , Ashoke Das	Mathematics	Journal of Advance Mathematical Studies	2021	2065-3506	https://www.journal.fairpartners.ro/editorial-board/5.htm	https://acrobat.adobe.com/id/urn:aaid:sc:AP:a59b2dcd-3873-4cb4-9eb2-97c4dadc2880	Yes. Scopus Indexed Journal


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17	LP-Sasakian Manifold equipped with Zamkovoy connection and Conharmonic curvature tensor	Abhijit Mandal, Ashoke Das	Mathematics	Journal of Indonesian Mathematical Society	2021	2460-0245 (e) 2086-8952 (p)	https://jims-a.org/index.php/jimsa	https://doi.org/10.22342/jims.27.2.960.137-149	Yes
18	Retrieving Unheard Voices of Komagata Maru	Dr. Abhinandan Das	History	Journal of Sikh & Punjab Studies, Global Institute for Sikh Studies, Vol.28, No.1, New York	2021	0971-5223	http://giss.org/jsp_vol_27.html	http://giss.org/jsp_vol_28/10-book_reviews.pdf	Yes
19	Metal-free multicomponent approach for the synthesis of propargylamine: A review	Sujit Ghosh and Kinkar Biswas	Chemistry	RSC Advance	2021	2046-2069	https://www.rsc.org/journals-books-databases/about-journals/rsc-advances/	https://acrobat.adobe.com/id/urn:aa:sc:ap:ba701819-cdf4-4197-8fc9-bb3405c66c89	Yes. Scopus Indexed Journal

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20	Projective curvature Tensor with respect to Zamkovoy connection in Lorentzian para-Sasakian manifolds	Abhijit Mandal, Ashoke Das	Mathematics	Journal of Indonesian Mathematical Society	2020	2086-8952	https://ijms-a.org/index.php/ijmsa	https://acrobat.adobe.com/id/urn:aa:id:sc:AP:381815a1-e906-4fbb-98bd-0bf4cd4c49ab	Yes. Scopus Indexed Journal
21	On M-projective curvature tensor of Sasakian manifolds admitting Zamkovoy connection	Abhijit Mandal, Ashoke Das	Mathematics	Advances in Mathematics: Scientific Journal	2020	1857-8438	https://www.research-publication.com/amsj/	https://acrobat.adobe.com/id/urn:aa:id:sc:AP:e68b0a4d-06da-430b-bec2-623475d0666d	Yes. Scopus Indexed Journal
22	Pseudo projective curvature tensor on Sasakian manifold admitting Zamkovoy connection	Abhijit Mandal, Ashoke Das	Mathematics	Bulletin of Calcutta Mathematical Society	2020	0008-0659	https://www.calmathsociety.co.in/cmsPublications.html	https://acrobat.adobe.com/id/urn:aa:id:sc:AP:81aaa4d9-d9a9-40b0-a580-53ee0d068d91	Yes. Scopus Indexed Journal

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23	Immunodetection of <i>Alternaria alternata</i> and Evolution of Antifungal Compounds in Tea Leaf Tissues Following Challenge Inoculation with Pathogen'	Rakhee Das Biswas and Bishwanath Chakraborty	Department of Botany	Journal of Mycology and Plant Pathology	2020	0971-9393	https://www.connectjournal.com/pages/journaldetails/jmpp	https://www.ismp.org.in/wp-content/uploads/2022/10/ABSTS_50_03_02.pdf	Yes
24	'Root colonization with Arbuscular mycorrhizal fungi and Dark septate Endophytes in Tea plants'	Rakhee Das Biswas , Utanka Kumar De and Bishwanath Chakraborty	Department of Botany	Journal of Mycology and Plant Pathology	2020	0971-3719	https://www.connectjournal.com/pages/journaldetails/jmpp	https://shorturl.at/uyVX5	https://acrobot.adobe.com/id/urn:aaid:sc:AP:ca9bc689-4326-47ec-8e5f-70bad18bcf25


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25	'Evaluation of leaf extract of <i>Azadirachta indica</i> , <i>Catharanthus roseus</i> and <i>Diplazium esculentum</i> on tea plants for induction of resistance against <i>Alternaria alternata</i> .	Rakhee Das Biswas and Bishwanath Chakraborty	Department of Botany	Journal of Botanical Society of Bengal	2020	0971-2976	https://botansocbengal.org/pdf/vol-74-no1.pdf	https://acrobat.adobe.com/id/urn:aaid:sc:AP:8e921e0a-c7b3-46e3-b322-4f977db37fc8	Yes


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26	Internal Oligoguanidinium Transporter: Mercury-free scalable synthesis, improvement of cellular localization, endosomal escape, mitochondrial localization and conjugation with antisense morpholino for NANOG inhibition to induce chemosensitization of Taxol in MCF-7 cells.	Jayanta Kundu, Priyanjalee Banerjee , Chandra Bose, Ujjal Das, Ujjwal Ghosh, and Surajit Sinha	Department of Zoology	Bioconjugate Chemistry	2020	1043-1802	https://pubs.acs.org/journal/bcches	https://pubs.acs.org/doi/10.1021/acs.bioconjchem.0c00444	Yes. Scopus Indexed Journal


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27	Evaluation of a Tubulin-targeted pyrimidine indole hybrid molecule as an anticancer agent.	Chandra Bose, Priyanjalee Banerjee , Jayanta Kundu, Biswadeb Dutta, Indranil Ghosh, Shreya Sinha, Argha Ghosh , Abhishek Barua, Shalini Gupta, Dr. Ujjal Das, Prof. Siddhartha S. Jana, Prof. Surajit Singh	Department of Zoology	Chemistry Select	2020	2365-6549	https://chemistry-europe.onlinelibrary.wiley.com/journal/23656549	https://chemistry-europe.onlinelibrary.wiley.com/doi/epdf/10.1002/slct.202003322	Yes. Scopus Indexed Journal


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28	Evaluation of Cysteine Protease C of Leishmania donovani in Comparison with Glycoprotein 63 and Elongation Factor 1 α for Diagnosis of Human Visceral Leishmaniasis and for Posttreatment Follow-Up	Nicky Didwania, Sarfaraz Ahmad Ejazi, Rudra Chhajer, Abdus Sabur , Saumyabrata Mazumder, Mohd Kamran, Raunak Kar, Krishna Pandey, Vidya Nand Ravi Das, Pradeep Das, Mehebubar Rahaman, Rama Prosad Goswami, Nahid Ali	Department of Botany	Journal of Clinical Microbiology	2020	0095-1137	https://pubmed.ncbi.nlm.nih.gov/32848039/	https://journal.s.asm.org/journal/jcm	Yes. Scopus Indexed Journal


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29	TANK SIZE AND AQUACULTURE MANAGEMENT INFLUENCE ON THE PRODUCTION OF GOLD FISH, CARASSIUS AURATUS (L.), UNDER TROPICAL CONDITIONS	Prithwiraj Jha	Department of Zoology	Animal Science Series: Lucrări Științifice - Seria Zootehnie	2020	1841-9364	https://spsb.ro/index.php/public_html	https://www.researchgate.net/publication/343384703_TANK_SIZE_AND_AQUACULTURE_MANAGEMENT_INFLUENCE_ON_THE_PRODUCTION_OF_GOLD_FISH_CARASSIUS_AURATUS_L_UNDER_TROPICAL_CONDITIONS#fullTextFileContent	Yes


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30	MANAGEMENT INDUCED CHANGES IN POND WATER QUALITY AND GROWTH PERFORMANCE OF GOLDFISH, <i>Carassius auratus</i> (L.), IN TWO 11-WEEK GROWTH EXPERIMENTS CONDUCTED DURING THE SUMMER AND WINTER SEASONS	Prithwiraj Jha	Department of Zoology	AgroLife Scientific Journal	2020	2285-5718	https://agrolifejournal.usamv.ro/index.php/agrolife	https://acrobat.adobe.com/id/urn:aaid:sc:AP:e37e6e99-003e-4f0e-9154-e0461b0a687d	Yes
31	Spectroscopic study of ^{38}K above the 31.67 μs isomer	Rozina Rahaman, Abhijit Bisoi, Y. Sapkota, Anik Adhikari, Ananya Das, S. Sarkar, M. Saha Sarkar, A. Goswami, S. Ray, M. Roy Basu, Debasmita Kanjilal , Somnath Nag, K. Selvakumar, N. Madhavan, S. Muralithar, and R. K. Bhowmik	Physics	Physical Review C	2020	2469-9993	https://journals.aps.org/prc/	https://acrobat.adobe.com/id/urn:aaid:sc:AP:ca6ea58a-7676-4349-ad13-c1e987fac285	Yes. Scopus Indexed Journal


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32	Ion-exchange Resins and Polypeptide Supported catalysts: A Critical Review.	Kinkar Biswas, Sujit Ghosh and Basudeb Basu	Chemistry	Current Green Chemistry	2020	2213–347X	https://www.eurekaselect.com/journal/141/abstract-out-journal	https://shorturl.at/fvzHP	Yes. Scopus Indexed Journal
33	Recent Advances in Microwave Promoted C–P Cross–coupling Reactions	Sujit Ghosh , Kinkar Biswas and Basudeb Basu	Chemistry	Current Microwave Chemistry	2020	2213-3364	https://www.eurekaselect.com/journal/144/abstract-out-journal	https://acrobat.adobe.com/id/urn:aaid:sc:AP:6e7509ec-a69d-4038-811f-8b2a217eb69b	Yes. Scopus Indexed Journal


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							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
34	Nuclear Data Sheets for A=218	Balraj Singh, M.S. Basunia, Murray Martin, E.A. McCutchan, Indu Bala, R. Caballero-Folch, Rhiann Canavan, Ritwika Chakrabarti, A. Chekhovska, M.M. Grindler, Samra Kaim, Debasmita Kanjilal , D. Kasperovych, M.J. Kobra, H. Koura, Soumen Nandi, Adina Olacel, Abhilasha Singh, and B.P.E. Tee	Physics	Nuclear Data Sheets	2019	0090-3752 (Print)	https://www.sciencedirect.com/journal/nuclear-data-sheets	https://acrobat.adobe.com/id/urn:aaid:sc:AP:f709ca07-e044-4f12-9ca4-9159647f01bd	Yes. Scopus Indexed Journal
35	Task-Specific Properties and Prospects of Ionic Liquids in Cross-Coupling Reactions	Bablee Mandal, Sujit Ghosh and Basudeb Basu	Chemistry	Topic in Current Chemistry	2019	0340-1022	https://link.springer.com/journal/41061	https://acrobat.adobe.com/id/urn:aaid:sc:AP:f3138991-2e21-41cd-a422-5bd1ff8390c3	Yes. Scopus Indexed Journal


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							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
36	Evaluation of different water exchange regimes for optimizing growth and production of koi carp, <i>Cyprinus carpio</i> in tanks	Prithwiraj Jha	Zoology	Iranian Journal of Ichthyology	2019	P- ISSN: 2383-1561; E- ISSN: 2383-0964	https://ijic-hthyol.org/index.php/iji/abot/submissions	10.22034/iji.v6i4.402	Yes
37	EBI-3 Chain of IL-35 Along With TGF- β Synergistically Regulate Anti-leishmanial Immunit	Abdus Sabur	Botany	Frontiers in Immunology	2019	1664-3224	https://www.frontiersin.org/journals/immunology	https://acrobat.adobe.com/id/urn:aaid:sc:AP:84150122-7e4c-4d4f-ae51-0ae15928b55b	Yes. Scopus Indexed Journal


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38	উত্তর দিনাজপুর জেলার হাটের ইতিকথা	Dr. Shimul Chandra Sarkar	Bengali	লোকশ্রুতি	2019	2322-0961 (Print)	NA	NA	NA
39	'Rajadarsha, Krishi-arthaniti o Loko-jeeban: Mukundaramer Chandimangol-KalketuAkhyan' (in Bengali)	Abhinandan Das & Arpita Dutta	History	Abhijatri Feri (Journal of Folklore Education and Research Institute)	2018	2231-2862	Journal of Folklore and Education (ifepublications.org)	https://acrobat.ado.be.com/id/urn:aaid:sc:AP:5a27e3b1-078a-4867-b9491-802acac786fd	Yes
40	Cosmological time crystal: Cyclic universe with a small cosmological constant in a toy model approach	Praloy Das, Supriya Pan , Subir Ghosh and Probir Pal	Mathematics	PHYSICAL REVIEW D	2018	2470-0029	https://journals.aps.org/prd/	https://acrobat.ado.be.com/id/urn:aaid:sc:AP:3f51825e-2861-46f9-b98c-a8a71d22c6b8	Yes, Scopus Indexed


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41	Cosmological time crystal: Cyclic universe with a small cosmological constant in a toy model approach	Praloy Das, Supriya Pan , Subir Ghosh and Probir Pal	Mathematics	PHYSICAL REVIEW D	2018	2470-0029	https://journals.aps.org/prd/	https://acrobat.adobe.com/id/urn:aaid:sc:AP:3f51825e-2861-46f9-b98c-a8a71d22c6b8	Yes, Scopus Indexed
42	Observational constraints on oscillating dark-energy parametrizations	Supriya Pan , Emmanuel N. Saridakis and Weiqiang Yang	Mathematics	PHYSICAL REVIEW D	2018	1550-2369	https://journals.aps.org/prd/	https://acrobat.adobe.com/id/urn:aaid:sc:ap:f5f283c4-b73b-489f-bb5e-cff19a3dc23d	Yes, Scopus Indexed


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43	Tale of stable interacting dark energy, observational signatures, and the H0 tension	Weiqliang Yang, Supriya Pan , Eleonora Di Valentino, Rafael C. Nunes, Sunny Vagnozzie and David F. Motag	Mathematics	Journal of Cosmology and Astroparticle Physics	2018	1475-7516	https://iopscience.iop.org/journal/1475-7516	https://acrobat.adobe.com/id/urn:aaid:sc:AP:c51c6a11-60eb-4d02-b10d-fdba70006976	Yes, Scopus Indexed
44	A study on out-of-Pocket Healthcare Expenditure of the people of Siliguri Municipal Corporation Area (SMCA)*	Subrata Ghosh	Economics	Journal of Emerging Technologies and Innovative Research	2018	2349-5162	https://jetir.org/	https://acrobat.adobe.com/id/urn:aaid:sc:AP:687e2cd2-2808-4702-97db-16e51269b59c	Not found in Care List
45	Health seeking behavior of North Bengal: A study of the effects of socio-economic and demographic characteristics on the healthcare facilities in Siliguri Municipal Corporation Area (SMCA)	Subrata Ghosh	Economics	Global Journal of Research Analysis	2018	2277-8160	https://www.worldwidejournals.com/global-journal-for-research-analysis-GJRA/	https://acrobat.adobe.com/id/urn:aaid:sc:AP:4661b509-f5b0-464e-8782-40c70addc192	Yes

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46	Bengali Women's Writings in the Colonial Period: Critique of Nation, Narration, and Patriarchy	Sanchayita Paul Chakraborty and Dhritiman Chakraborty	English	Zeitschrift für Anglistik und Amerikanistik	2018	2196-4726	https://www.degruyter.com/journal/key/zaa/html?lang=de	https://doi.org/10.1515/zaa-2018-0004	Yes
47	Maoism and its Relevance- Challenges to Globalized India	Arindam Debnath	Political Science	Global Journal of Research Analysis	2018	2277-8160	https://www.worldwidejournals.com/global-journal-for-research-analysis-GJRA/	https://www.worldwidejournals.com/global-journal-for-research-analysis-GJRA/fileview/August_2018_1534853127_56.pdf	Yes
48	Disciplinary Planning and Business Opposition in Colonial India, 1942 – 1945: the Myth of Developmental Bourgeoisie, pp. 100-115,	Abhinandan Das	History	Journal of History, Vol. 32, Dept. of History, Jadavpur University, Kolkata	2018	0976-5476	https://jadavpuruniversity.in/download-centre-categories/departamental-journal/	https://www.academia.edu/36754663/Disciplinary_Planning_and_Business_Opposition_in_Colonial_India_1942_1945_The_Myth_of_Developmental_Bourgeoisie_Journal_of_History_Jadavpur_University_Vol_32_2017_2018	Yes (Peer Reviewed and UGC Enlisted No. 40835)

Chandan B.
 Principal
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49	Ideas of Developmental Planning in Colonial India, 1930 – 1940: Formation of the National Planning Committee and Business Opposition	Abhinandan Das	History	Quarterly Review of Historical Studies, Vol. 57, No. 3 & 4, Kolkata	2018	0033-5800	https://searchworks.stanford.edu/view/487908	https://scholar.google.co.in/citations?view_op=view_citation&hl=en&user=B3bkMWAAAAAJ&citation_for_view=B3bkMWAAAAAJ:Tyk-4Ss8FVUC	Yes (Peer Reviewed and UGC enlisted No. 40852)
50	From Doro to Dock: Transformation of Haldia Port Complex	Abhinandan Das	History	Karatoya, Department of History Journal, University of North Bengal, Vol. 11	2018	2229-4880	https://ir.nbu.ac.in/handle/123456789/3938	https://ir.nbu.ac.in/handle/123456789/3938	Yes (Peer Reviewed and UGC Approved, No. 42512)


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SYNTHETIC COMMUNICATIONS REVIEWS



Microwave-assisted synthesis of indolizine derivatives: Recent developments: A review (2003–present)

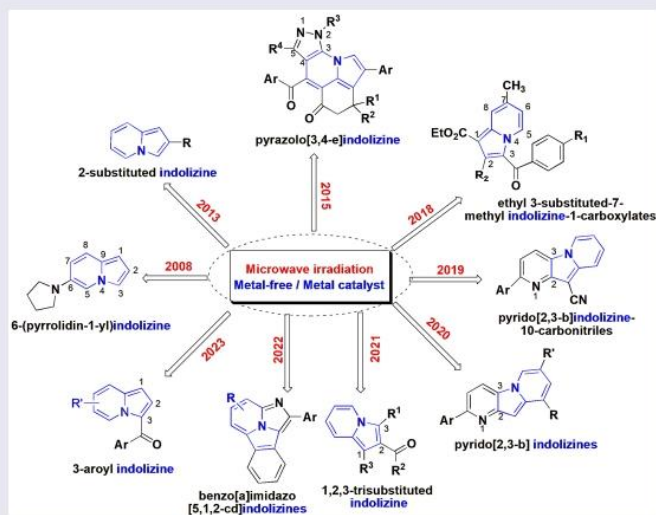
Sujit Ghosh^a and Kinkar Biswas^b

^aDepartment of Chemistry, Raiganj Surendranath Mahavidyalaya, Raiganj, West Bengal, India; ^bDepartment of Chemistry, University of North Bengal, Darjeeling, West Bengal, India

ABSTRACT

Microwave-assisted organic synthesis has emerged as the best replacement for the conventional thermal synthetic methodology in organic reactions. It is one of the effective non-conventional activation methods, which has been increasingly used during the past thirty years. Keeping in mind the serious threats to the environment, it is almost mandatory to apply green tools in organic synthesis. A significant decrease in reaction time (from hours to minutes), higher chemical yield and selectivity, and lower chemical waste have made this alternative source of heating an attractive method in chemical transformations. Indolizine is an important heterocyclic scaffold and one of the privileged structural units of heterocycles, and they are found in a wide variety of pharmacophore molecules. The various conjugate derivatives of indolizine also find applications in materials chemistry, in addition to medicinal chemistry. The present mini-review describes microwave-assisted indolizine synthesis, particularly emphasizing recent literature (2003–2023).

GRAPHICAL ABSTRACT



ARTICLE HISTORY

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KEYWORDS

Microwave; indolizine;
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CONTACT Kinkar Biswas ✉ kinkar.chem@gmail.com Department of Chemistry, University of North Bengal, Darjeeling, West Bengal, India

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Chandan B
Principal
Raiganj Surendranath Mahavidyalaya
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The Bengal *Bargadars* Temporary Regulation Bill, 1947: An Antagonist of the Tebhaga Movement

Chandana Saha

Chandana Saha

Assistant Professor in History

Head of the Department of History

Raiganj Surendranath Mahavidyalaya

Abstract:

This article provides an antagonistic view of "The Bengal *Bargadars* Temporary Regulation Bill, 1947" to the Tebhaga Movement, a significant peasant movement in colonial Bengal. The movement emerged as a response to the exploitation and oppressive policies of landlords and the British colonial government. Sharecroppers, known as *Bargadars*, protested against unequal sharing of crops and excessive taxes imposed by landlords. The Bengal famine, caused by British policies during World War II, further worsened the conditions of sharecroppers. In 1946, the Tebhaga Movement was launched, demanding two-thirds of the crop share. The proposed Bengal *Bargadars* Temporary Regulation Bill of 1947 further fueled the movement, as it aimed to favor landlords and restrict *bargadars*' rights. The bill allowed land seizure, limited appeals to the Collector, and denied access to civil courts. However, the bill did not pass into law, providing some relief to the *bargadars*.

Keywords: Tebhaga movement, *bargadar*, landlord, Collector, the Bengal *Bargadar* Temporary Regulation Bill 1947.

The Tebhaga movement was a significant peasant struggle that took place in Bengal, India, during the late 1940s. The term "Tebhaga" translates to "one-third share," referring to the demand made by the peasants to retain two-thirds of the harvest instead of the traditional half. The movement arose as a response to exploitative land tenures and oppressive agrarian policies imposed by the zamindars (landlords) and the colonial British government. The peasants, predominantly sharecroppers and tenant farmers, faced abject poverty and were burdened with high rents, exorbitant interest rates, and unfair revenue collection. Led by the Kisan Sabha, a peasants' organization affiliated with the Communist Party of India, the Tebhaga movement aimed to secure better land rights and improved conditions for the peasants. The movement gained momentum through mass mobilization, protests, and strikes, with the peasants refusing to give up two-thirds of their harvest to the landlords. Although the Tebhaga movement didn't achieve its primary goal of one-third share, it succeeded in raising

Chandana Saha
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





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Dr. Abhijit Mandal

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A STUDY OF SOLITONS ON PARA-SASAKIAN MANIFOLDS WITH RESPECT TO A METRIC CONNECTION

ABHIJIT MANDAL, MEGHLAL MALLIK, GOPAN SAHA, AFSAR HOSSAIN SARKAR AND ASHOKE DAS

ABSTRACT. The objective of the present paper is to study Ricci soliton, η -Ricci soliton and Yamabe soliton with respect to a metric connection on para-Sasakian manifold. Moreover, the paper concerns with the study of Ricci soliton and Yamabe soliton with torse forming vector fields on para-sasakian manifold admitting the metric connection.

1. INTRODUCTION

The concept of Ricci flow was first introduced by R.S. Hamilton in the early 1980s. Hamilton [9] observed that the Ricci flow is an excellent tool for simplifying the structure of a manifold. It is the process which deforms the metric of a Riemannian manifold by smoothing out the irregularities. The Ricci flow equation is given by

$$\frac{\partial g}{\partial t} = -2S,$$

where g is a Riemannian metric, S is Ricci tensor and t is time. The solitons for the Ricci flow is the solutions of the above equation, where the metrics at different times differ by a diffeomorphism of the manifold. A Ricci soliton is represented by a triple (g, V, λ) , where V is a vector field and λ is a scalar, which satisfies the equation

$$L_V g + 2S + 2\lambda g = 0, \quad (1.1)$$

where S is Ricci curvature tensor and $L_V g$ denotes the Lie derivative of g along the vector field V . A Ricci soliton is said to be shrinking, steady, expanding according as $\lambda < 0$, $\lambda = 0$, $\lambda > 0$ respectively. The vector field V is called potential vector field and if it is a gradient of a smooth function, then the Ricci soliton (g, V, λ) is called a gradient Ricci soliton and the associated function is called the potential function. Ricci soliton was further studied by many researcher. For instance, we see [19, 22, 24, 26] and their references.

As a generalization of Ricci soliton, the η -Ricci soliton was introduced by Cho and Kimura [6]. This notion has also been studied by Călin and Crasmareanu [7]. Later, remarkable studies on η -Ricci soliton have been made by A.M. Blaga [4] and D.G. Prakasha [21]. Let M be a Riemannian manifold with structure (ϕ, ξ, η, g) . Consider the equation

$$L_V g + 2S + 2\lambda g + 2\mu\eta \otimes \eta = 0, \quad (1.2)$$

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Key words and phrases: Para-Sasakian manifold, metric connection, Ricci soliton, Yamabe soliton.

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
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তারাশঙ্করের 'কবি' : পুনর্বিবেচনা

ড. শিমুল চন্দ্র সরকার
সহকারী অধ্যাপক, বাংলা বিভাগ
রায়গঞ্জ সুরেন্দ্রনাথ মহাবিদ্যালয়
ইমেইল : sarkarshimul86@gmail.com

Keyword

নিতাই, কবিগান, প্রণয়, ঠাকুরবি, বসন্ত, যৌনতা, ঝুমুরদল, আঞ্চলিকতা ও নিঃসঙ্গতা।

Abstract

প্রবাদ প্রতিম কথাসাহিত্যিক তারাশঙ্কর বন্দ্যোপাধ্যায়ের অনবদ্য সৃষ্টি 'কবি' উপন্যাসে কেন্দ্রীয় চরিত্র নিতাই-এর সমাহত জীবন ও জীবনাদর্শ প্রতিফলিত হয়েছে। সহজ, সরল ও প্রাণবন্ত ভঙ্গিতে উপন্যাসটির প্লট নির্মিত। উপন্যাসের কাহিনীকে পাঁচটি পর্বে বিভক্ত করা যায়। প্রথম পর্বে, নিতাই-এর বংশ পরিচয় ও ভবিষ্যৎ জীবনে কবিয়াল হওয়ার স্বপ্ন। দ্বিতীয় পর্বে, কবিয়াল হিসেবে নিজেকে প্রতিষ্ঠিত করা ও নিতাই-ঠাকুরবির প্রণয়। তৃতীয় পর্বে, নিতাইয়ের ঝুমুর দলে যোগদান এবং বসন্তের সঙ্গে অন্তরঙ্গ ঘনিষ্ঠতা। চতুর্থ পর্বে, বসন্ত ও ঠাকুরবির মৃত্যুতে নিতাইয়ের নিঃসঙ্গতা। পঞ্চম পর্বে, অস্থির চিন্তে তীর্থক্ষেত্রে গমন ও পরিশেষে স্বগ্রামে প্রত্যাবর্তন। কবিত্বময়তা, নাটকীয়তা, বাস্তবতা, প্রণয়, নিঃসঙ্গতা ও জীবনদর্শন উপন্যাসটিকে এক ভিন্ন মাত্রায় পৌঁছে দিয়েছে। কবিয়াল নিতাই-এর সত্যাদর্শ ও জীবনাদর্শ উপন্যাসটিতে বড় হয়ে উঠেছে।

Discussion

পল্লীজীবনশ্রয়ী আঞ্চলিক চেতনা পুষ্ট বাস্তব অথচ বিচিত্র স্বাদী এক রসসাহিত্য নিয়ে তারাশঙ্কর বন্দ্যোপাধ্যায় (২৩শে জুলাই ১৮৯৮ – ১৪ সেপ্টেম্বর ১৯৭১) বাংলা কথাসাহিত্যের আসরে আবির্ভূত হন। 'তিনি আমাদের অস্থির সংশয় বিক্ষুব্ধ অবিশ্বাসী যুগের প্রধান কথাশিল্পী।' কল্লোল-গোষ্ঠীর তরুন লেখকদের অবক্ষয় ধর্মী দ্বিধাগ্রস্ত জীবনচেতনার পটভূমিতে তারাশঙ্কর নিয়ে এলেন এক সুস্থ সবল ও ঝঞ্জু জীবনবোধ, জীবনের রস ও রহস্যের এক আদিম প্রাণবন্ত চেতনা।

"তারাশঙ্কর আধুনিক কালের জীবন শিল্পী, সমাজের ক্রনিক্লার, পরিচিত জীবনের রূপকার।"

কবি উপন্যাসটি ১৩৪৮ বঙ্গাব্দে (মার্চ ১৯৪২) প্রকাশিত হয়। উৎসর্গ 'সত্য ও সুন্দরের উপাসক পরম শ্রদ্ধেয় শ্রী যুক্ত মোহিতলাল মজুমদার শঙ্কাজানেম্।' প্রকাশক কাত্যায়নী বুক স্টল, কোলকাতা। গ্রন্থবদ্ধ হওয়ার পূর্বে 'কবি' পাটনা থেকে প্রকাশিত ও মনীন্দ্রনাথ সমাদ্দার সম্পাদিত 'প্রভাতী' পত্রিকায় ধারাবাহিক ভাবে প্রকাশিত হয়। উপন্যাসটির বীজগল্প 'কবি'প্রবাসী মাসিক পত্রের ১৩৪৭ বঙ্গাব্দের একটি সংখ্যায় প্রকাশ পায়। অভিন্ন নামে উপন্যাসটি ১৯৫৪ সনে হিন্দিতে এবং ১৯৭৩ সনে ওড়িয়াতে অনূদিত হয়। 'কবি' উপন্যাসের চলচ্চিত্রকার দেবকী বসু।





High-spin states of ^{204}At : isomeric states and shears band structure

D. Kanjilal¹, S. K. Dey^{2,3}, S. S. Bhattacharjee⁸, A. Bisoi⁶, M. Das², C. C. Dey², S. Nag⁷, R. Palit⁴, S. Ray⁵, S. Saha⁴, J. Sethi⁴, S. Saha^{2,a}

¹ Department of Physics, Raiganj Surendranath Mahavidyalaya, Raiganj, West Bengal 733134, India

² Saha Institute of Nuclear Physics, A CI of Homi Bhabha National Institute, I/AF Bidhan Nagar, Kolkata 700064, India

³ Present address: KEK, Tsukuba, Japan

⁴ Tata Institute of Fundamental Research, Mumbai 400005, India

⁵ Mody University of Science and Technology, Sikar, Rajasthan 332311, India

⁶ Indian Institute of Engineering Science and Technology, Shibpur, Howrah 711103, India

⁷ Indian Institute of Technology (Banaras Hindu University), Varanasi 221005, India

⁸ TRIUMF, 4004 Wesbrook Mall, Vancouver, BC V6T 2A3, Canada

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Abstract High-spin states of neutron-deficient trans-lead nucleus ^{204}At were populated up to ~ 8 MeV excitation through the $^{12}\text{C} + ^{197}\text{Au}$ fusion evaporation reaction. Decay of the associated levels through prompt and delayed γ -ray emissions were studied to evaluate the underlying nuclear structure. The level scheme, which was partly known, was extended further. An isomeric 16^+ level with observed mean lifetime $\tau = 52 \pm 5$ ns, was established from our measurements. Attempts were made to interpret the excited states based on multi quasiparticle and hole structures involving $2f_{5/2}$, $1h_{9/2}$, and $1i_{13/2}$ shell model states, along with moderate core excitation. Magnetic dipole band structure over the spin parity range: $16^+ - 23^+$ was confirmed and evaluated in more detail, including the missing cross-over $E2$ transitions. Band-crossing along the shears band was observed and compared with the evidence of similar phenomena in the neighbouring ^{202}Bi , ^{205}Rn isotones and the ^{203}At isotope. Based on comparison of the measured $B(M1)/B(E2)$ values for transitions along the band with the semiclassical model based estimates, the shears band of ^{204}At was established along with the level scheme.

1 Introduction

The nuclear structure of the neutron-deficient nuclei very near the doubly magic ^{208}Pb nucleus has been one of the major areas of experimental investigation for many reasons.

^a e-mail: satyajit.saha@saha.ac.in (corresponding author)

Firstly, many of these nuclei were studied to look for applicability of shell model with moderate core excitation to explain the high-spin states [1–3]. These studies were possible due to the availability of cooled High Purity Germanium (HPGe) based γ -ray detectors with unprecedented energy resolution to pin point the basic structural subtleties. Secondly, the yield of neutron-deficient trans-lead nuclei populated to high-spin states by fusion evaporation pathway is very low due to depletion of the compound nuclei by the competing fission channels. However, large array of HPGe detectors and the Clover detectors made available over the last three decades, along with versatile techniques of channel selection, made it possible to probe these nuclei to very high spin and excitation energy. Thirdly, these nuclei with a few valence protons and neutron holes, which belong to relatively high- j orbitals ($f_{5/2}$, $h_{9/2}$, and $i_{13/2}$), are expected to manifest various co-operative phenomena as the collectivity sets in for the high-spin states.

With moderate core excitations as the basis, these nuclei ($Z \sim 82$, $N \sim 120$) first evolve from a spherical to weak oblate shape. The valence particles and holes tend to align along the rotational symmetry axis giving rise to evolution of collective phenomena, the simplest manifestation being the observation of a series of magnetic dipole transitions between the high-spin states which appear to be regularly or semi-regularly placed following some order pattern. The magnetic dipole band, interpreted physically by the shears mechanism, has been explained by the tilted axis cranking (TAC) model [4, 5]. Shape co-existence and shape transition due to transformation from weak oblate shape to prolate





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Contradiction and Negotiation: New Economic Policy and Industrial Policy Transition in West Bengal, 1987 – 2000

Dr. Abhinandan Das

Abstract:

India's transition in 1991 to a regime of 'structural adjustment' is a watershed in the post-independence Indian economy. As an effect of this New Economic Policy (NEP), the traditional and indigenous industries were exposed to a severe crisis. In West Bengal, the impact of NEP onslaught was greater. In West Bengal the situation became even worse in respect of the industries, both in the private and public sectors, which had already started becoming sick for various reasons, including lack of investment, old machineries, managerial inefficiency and lack of ability to withstand competition in the market. Initially, the NEP faced massive mass opposition mobilised by the left-wing parties, but later the Left Front government adopted its own policy to revive the stagnating industrial condition of the state. This article attempts to analyse this policy transition and its impact on industries in West Bengal from 1987-2000.

Keywords: NEP, Left Front, West Bengal, Industry

By the beginning of 1990s, India witnessed a sharp break from the earlier period of Nehruvian mixed economic policy. During the tenure of the Narasimha Rao-led Congress government, the New Economic Policy (NEP) was adopted in 1991, though the ground was prepared earlier. In the mid-1980s, the *Licence-Permit Raj* was withdrawn, and India's economy was gradually opened up to foreign investors and domestic private players under the initiative of the then Prime Minister Rajiv Gandhi. He adopted some pro-market policies of import liberalisation, concessions to foreign capital, and reforms were also introduced in the field of telecommunication, broadband system, etc. The Monopoly and Restrictive Trade Practice Act (MRTP) was redefined; electronic machinery, machine tool, drug-related industries, etc., were de-licenced; and private production of telecommunication equipment was also allowed during this period (Nayar, 1990, pp.58-63). However, Rajiv Gandhi's reform policy and his pro-business budget of 1985 were highly criticised within the Congress party itself because it was a sharp break from the earlier policy of a 'socialistic pattern of development' as an exclusive aim.¹ The trade union organisations also opposed his privatisation plan of public sector units and the oppositions cornered him by the Bofors scandal.² In

¹ *Rajiv Gandhi, Selected Speeches and Writings-1986*. Government of India. New Delhi, Publication Division, (1989), pp. 66-72.

² In 1986 the Government of India signed an arm deal with Swedish arms manufacturer AB Bofors for the supply of Howitzer guns for the Army. It was alleged that to secure the contract the company had bribed top Indian politicians and army officers. The scandal became a political agenda against the Rajiv Gandhi led government in the late 1980s. For more details, see Henrik Westander. (1992). *Classified: The Political*

Chandan Das
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
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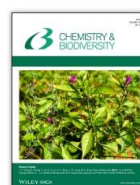
Cananginone Abrogates EMT in Breast Cancer Cells through Hedgehog Signaling

Chandra Bose, Ujjal Das, Tapan Kumar Kuilya, Joyanta Mondal, Jhuma Bhadra, Priyanjalee Banerjee, Rajib Kumar Goswami, Surajit Sinha ✉

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Abstract

Cananginones, a family of linear acetogenins found as secondary metabolites in the plant kingdom, show cytotoxicity against several types of cancer cells. We aimed to investigate the efficacy of cananginone and its mechanism as an anti-cancer agent. Our initial screening of Cananginone against HepG2, PC3, A549, and MCF7 cells showed anti-cancer activities and is more potent against MCF7 cells, consistent with the previous report. Next, cell-based assays have revealed that cananginone abrogates cancer stem cell renewal as well as Epithelial-Mesenchymal Transition (EMT) and increased the ROS level beyond the threshold level thus reducing the viability of



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Chandan B
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
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Dr. Abhijit Mandal

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Ricci soliton on Sasakian manifolds admitting Zamkovoy connection

Abhijit Mandal*

Department of Mathematics
Raiganj Surendranath Mahavidyalaya
Raiganj, Uttar Dinajpur, Pin-733134
West Bengal
India
abhijit4791@gmail.com

Ashoke Das

Department of Mathematics
Raiganj University
Raiganj, Uttar Dinajpur, Pin-733134
West Bengal
India

Afsar Hossain Sarkar

Sahooryachhi BMNH High School
Chanchal, Malda, Pin-732123
West Bengal
India

Abstract. Object of this paper is to study Ricci soliton on concircularly flat, W_2 -flat, W_3 -flat, W_4 -flat Sasakian manifolds with respect to Zamkovoy connection. Besides these, we discuss Ricci soliton on a Sasakian manifold satisfying $W_2^*(\xi, Y) \cdot R^* = 0$, where R^* denotes Riemannian curvature tensor with respect to Zamkovoy connection and W_2^* -denotes the W_2 -curvature tensor with respect to Zamkovoy connection.

Keywords: Sasakian manifold, Zamkovoy connection, Ricci soliton, concircular curvature tensor, W_2 -curvature tensor, W_3 -curvature tensor, W_4 -curvature tensor.

1. Introduction

The notion of Sasakian structure [16] was introduced by Japanese mathematician S. Sasaki in the year 1960. If a contact metric structure is normal then the structure is said to have a normal contact metric structure or a Sasakian structure. Thus a manifold with Sasakian structure is a normal contact metric manifold. In some respect Sasakian manifold may be viewed as an odd dimensional analogues of Kähler manifold. Sasakian manifold was further studied by many authors. For details, we refer ([4], [9], [11], [5]) and the references therein.

*. Corresponding author

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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ZAMKOVY CONNECTION ON LORENTZIAN PARA-KENMOTSU MANIFOLDS

ABJIJIT MANDAL¹, AFSAR HOSSAIN SARKAR² AND ASHOKE DAS³

(Received 6 June 2021 and revision received 16 March 2022)

Abstract. In this paper we introduce a non-metric linear connection called Zamkovoy connection on Lorentzian para-Kenmotsu manifold and obtain η -Ricci soliton with respect to this connection. Moreover, we study concircularly flat, ϕ -concircularly flat Lorentzian para-Kenmotsu manifolds with respect to Zamkovoy connection. Besides these, we discuss ξ -pseudo projectively flat and ϕ -pseudo projectively flat Lorentzian para-Kenmotsu manifolds with respect to Zamkovoy connection.

Mathematics Subject Classification 2020 : 53D15, 53C05, 53C25

Key words and phrases: Lorentzian para-Kenmotsu manifold, Zamkovoy connection, concircular curvature tensor, pseudo projective curvature tensor

1. Introduction. The notion of Lorentzian para-Kenmotsu manifold has been introduced by A. Haseeb and R. Prasad (Haseeb and Prasad, 2021). Recently, N.V.C. Shukla and A. Dixit (Shukla and Dixit, 2020) studied ϕ -recurrent Lorentzian para-Kenmotsu manifolds and find that such type of manifolds are η -Einstein. Further, V. Chandra and S. Lal (2020) studied some special results on 3-dimensional Lorentzian para-Kenmotsu manifolds.

In 2008, the notion of Zamkovoy canonical connection (briefly, Zamkovoy connection) was introduced by S. Zamkovoy (2008) for a para-contact manifold. And this connection was defined as a canonical para-contact connection whose torsion is the obstruction of para-contact manifold to be a para-Sasakian manifold. Later, A. Biswas and K. K. Baishya studied this connection on generalized pseudo Ricci symmetric Sasakian manifolds (Biswas and Baishya, 2019) and on almost pseudo symmetric Sasakian manifolds (Biswas and Baishya, 2019). This connection was further studied by A.M. Blaga (Blaga, 2015). In 2020, A. Mandal and A. Das et al. (Mandal and Das, 2020) studied in detail on various curvature tensors of Sasakian and LP-Sasakian manifolds admitting this connection. For an n -dimensional almost contact metric manifold M equipped with an almost contact metric structure (ϕ, ξ, η, g) consisting

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)

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¹DEPARTMENT OF MATHEMATICS
RAIGANJ SURENDRANATH MAHAVIDYALAYA
RAIGANJ, UTTAR DINAJPUR
WEST BENGAL, INDIA


E-MAIL (CORRESPONDING AUTHOR) : abhijit4791@gmail.com

²DEPARTMENT OF MATHEMATICS
RAIGANJ UNIVERSITY
RAIGANJ, UTTAR DINAJPUR
WEST BENGAL, INDIA

E-MAIL : afsarsarkar1986@gmail.com

³DEPARTMENT OF MATHEMATICS
RAIGANJ UNIVERSITY
RAIGANJ, UTTAR DINAJPUR
WEST BENGAL, INDIA

E-MAIL : ashoke.avik@gmail.com


Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhijit Mandal

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SOME CURVATURE PROPERTIES AND RICCI SOLITON ON SASAKIAN MANIFOLD ADMITTING A METRIC CONNECTION

ABHIJIT MANDAL, GOPAN SAHA AND ASHOKE DAS

ABSTRACT. In this paper we study Ricci solitons on pseudo-projectively flat, quasi-pseudo-projectively flat and quasi-concircularly flat Sasakian manifolds with respect to a new metric connection. Besides these, we study Ricci solitons on some special type of Sasakian manifolds satisfying certain conditions.

1. INTRODUCTION

The concept of Ricci flow and its existence was introduced by R.S. Hamilton [6] in the year 1982. He observed that the Ricci flow is an excellent tool for simplifying the structure of a manifold. This concept was developed to answer Thurston's geometric conjecture which says that each closed three manifolds admits a geometric decomposition. The Ricci flow equation is given by $\frac{\partial g}{\partial t} = -2S$, where g is a Riemannian metric, S is Ricci curvature tensor and t is the time. Hamilton [7] also introduced a self similar solution of the Ricci flow equation which is known as Ricci soliton and it is represented by a triple (g, V, λ) , where g is a Riemannian metric, V is a vector field and λ is a scalar, which satisfies the equation:

$$L_V g + 2S + 2\lambda g = 0, \quad (1.1)$$

where S is Ricci curvature tensor, $L_V g$ denotes the Lie derivative of g along the vector field V . The Ricci soliton is said to be shrinking, steady or expanding according as $\lambda < 0$, $\lambda = 0$ or $\lambda > 0$, respectively. If the vector field V is gradient of a smooth function h , then the Ricci soliton (g, V, λ) is called a gradient Ricci soliton and the function h is called the potential function. Ricci soliton was further studied by many researchers. For more details we refer [12, 17, 20, 21] and their references.

Sasakian manifold [18] was defined by Japanese mathematician S. Sasaki in the year 1960. If a contact metric structure is normal, then the structure is said to have a normal contact metric structure or a Sasakian structure. Sasakian manifolds have been studied by many authors. For instance, we see [3-5, 14] and their references.

In 2008, the notion of a new linear connection named as Zamkovoy canonical connection was introduced by S. Zamkovoy [24] for a para-contact manifold. And, this connection was defined as a canonical para-contact connection whose torsion is the obstruction of para-contact manifold to be a para-sasakian manifold. Later on, various curvature tensors in

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Key words and phrases: Sasakian manifold, Ricci soliton, Zamkovoy connection, concircular curvature tensor, pseudo-projective curvature tensor.

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Chandan J.
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)

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Raiganj Surendranath Mahavidyalaya
Department of Mathematics
Raiganj, West Bengal-733134, India
E-mail address: abhijit4791@gmail.com

Raiganj Surendranath Mahavidyalaya
Department of Mathematics
Raiganj, West Bengal-733134, India
E-mail address: sahogopan3110@gmail.com

Raiganj University
Department of Mathematics
Raiganj, West Bengal-733134, India
E-mail address: ashoke.avik@gmail.com

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
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Dr. Abhinandan Das



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Das, Abhinandan

Abstract

India's transition in 1991 to a regime of 'structural adjustment' is a watershed in the post-independence Indian economy. As an effect of this New Economic Policy (NEP), the traditional and indigenous industries were exposed to a severe crisis. In West Bengal, the impact

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Abhinandan Das
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhijit Mandal

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SOME CURVATURE PROPERTIES OF PARA-KENMOTSU MANIFOLD WITH RESPECT TO ZAMKOVY CONNECTION

ABHIJIT MANDAL, AFSAR HOSSAIN SARKAR,
ASHIS BISWAS, ASHOKE DAS

ABSTRACT. In the present paper we study some properties of the para-Kenmotsu manifold with respect to Zamkovoy connection. We discuss locally ϕ -symmetric para-Kenmotsu manifold with respect to the Zamkovoy connection. Also, we study Ricci Soliton on para-Kenmotsu manifold with respect to Zamkovoy connection. Besides these, we discuss W_i -curvature tensor ($i=0,1,2,\dots,9$) with respect to Zamkovoy connection on para-Kenmotsu manifold.

Key words and phrases : Para-Kenmotsu manifold, Zamkovoy connection, Ricci soliton, W_i -curvature tensor.

2020 Mathematics Subject Classification: 53C15.

1. INTRODUCTION

The notion of para-Kenmotsu manifold analogous to the structure of Kenmotsu manifold [7] was introduced by Welyczko [23]. Also, Sinha and Sai Prasad [19] introduced para-Kenmotsu manifolds as a subclass of para-contact manifold. Further, para-Kenmotsu manifolds have been studied by many researcher. For instance, we see ([4], [12], [13], [17], [18]) and the references therein.

In 2008, the notion of Zamkovoy canonical connection (briefly, Zamkovoy connection) on para contact manifold was introduced by S. Zamkovoy

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*Address correspondence to Abhijit Mandal; E-mail: abhijit4791@gmail.com

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Chandan J.
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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A. Mandal, A. H. Sarkar, A. Biswas and A. Das

Abhijit Mandal

Department of Mathematics, Raiganj Surendranath Mahavidyalaya, Raiganj, West Bengal-733134, India
Email: abhijit4791@gmail.com

Afsar Hossain Sarkar


Department of Mathematics, Raiganj University, West Bengal-733134, India
Email: afsarsarkarmath@gmail.com

Ashis Biswas

Department of Mathematics, Mathabhanga College, Mathabhanga, West Bengal-736146, India
Email: biswasashis9065@gmail.com

Ashoke Das

Department of Mathematics, Raiganj University, West Bengal-733134, India
Email: biswasashis9065@gmail.com


Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Subrata Ghosh

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An Examination of Implementation of Whistle-blowing Policies in Organizations

¹Dr. Shuvendu Dey ²Subrata Ghosh

Abstract

Fraud appears to be rising in the business world, with employees and management being the greatest perpetrators. A global survey by PricewaterhouseCoopers in 2009 found that at least 30% of companies had experienced fraudulent misdemeanors. Corporate Governance has fast emerged as a yardstick for evaluating corporate excellence in the context of national and international business practices. From guidelines and desirable code of conduct few years ago, corporate governance is now recognized as a model for improving competitiveness and enhancing efficiency and thus improving investors' confidence and accessing capital, both domestic as well as foreign. What is important is that corporate governance is becoming a dynamic concept and not static one. But for this to happen it is imperative that there exist a robust whistle-blowing mechanism that would provide employees with a high level of disclosure regarding the whistle-blowing process. The results of the study suggest that the degree of whistle-blowing disclosures is positively associated with the acceptability of anonymous reporting and organizational support for whistle-blowing, the composition of the audit committee, and the extent of concentrated shareholdings. The sheer existence of whistle-blowing disclosures could just be symbolic and nothing more.

Keywords: Fraud, Corporate Governance, Whistle-blowing, Employees, Management

¹**Dr. Shuvendu Dey, Asst Professor & Head,** Department of Business Administration, Siliguri Institute of Technology, Salbari, Sukna, India, email : shuvendudey@gmail.com, M : +91(0)9434019648

²**Subrata Ghosh, Asst Professor,** Raiganj Surendranath Mahavidyalay, Raiganj, India, email: subrataghosh_slg@rediffmail.com, M: +91(0)9832054174


Prtnclpal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhijit Mandal

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ON PSEUDO-PROJECTIVE CURVATURE TENSOR OF SASAKIAN MANIFOLD ADMITTING ZAMKOVY CONNECTION

ABHIJIT MANDAL AND ASHOKE DAS

ABSTRACT. The purpose of the present paper is to study some properties of Sasakian manifolds with respect to Zamkovoy connection. Here, we study pseudo-projectively flat, quasi-pseudo-projectively flat and ϕ -pseudo-projectively flat Sasakian manifolds admitting Zamkovoy connection. Further, we study generalized pseudo-projective ϕ -recurrent Sasakian manifolds along with some more curvature properties of Sasakian manifolds with respect to Zamkovoy connection.

Key Words: Sasakian manifold, Zamkovoy connection, pseudo-projective curvature tensor.

2010 Mathematics Subject Classification: Primary: 53C15; Secondary: 53C25.

1. INTRODUCTION

A linear connection $\bar{\nabla}$ defined on a Riemannian manifold M is said to be symmetric if torsion \bar{T} of $\bar{\nabla}$ defined by

$$\bar{T}(X, Y) = \bar{\nabla}_X Y - \bar{\nabla}_Y X - [X, Y],$$

is zero for any vector fields X, Y on M , otherwise, it is said to be non-symmetric. In 1932, Hayden [12] gave the idea of a metric connection on a Riemannian manifold and later named such connection a Hayden connection. A linear connection $\bar{\nabla}$ is called metric connection on a

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*Address correspondence to A. Mandal; E-mail: abhijit4791@gmail.com.

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Chandan K
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhijit Mandal

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ZAMKOVY CONNECTION ON LORENTZIAN PARA-SASAKIAN MANIFOLDS

ABHIJIT MANDAL

ABSTRACT. The object of the present paper is to introduce a new non-metric linear connection named as Zamkovoy connection in Lorentzian para-Sasakian manifolds (briefly, LP-Sasakian manifolds). In this paper we obtain expressions for Riemannian curvature tensor (R^*), Ricci tensor (S^*), Ricci operator (Q^*) and scalar curvature (r^*) with respect to Zamkovoy connection in LP-Sasakian manifolds. Moreover, we study generalized recurrent and generalized concircular ϕ -recurrent LP-Sasakian manifolds with respect to Zamkovoy connection. Besides these, we discuss an LP-Sasakian manifold M satisfying $W^*(X, Y).R^* = 0$, for all vector fields X, Y on M , where W^* denotes concircular curvature tensor with respect to Zamkovoy connection.

1. INTRODUCTION

Zamkovoy connection was introduced by S. Zamkovoy [16] and it was defined as a canonical para-contact connection whose torsion is the obstruction of para-contact manifold to be a para-sasakian manifold. In [1, 2], A. Biswas and K.K. Baishya studied this connection for a generalized pseudo Ricci symmetric Sasakian manifolds as well as for an almost pseudo-symmetric Sasakian manifolds. Motivated by their studies, I have tried to introduce Zamkovoy connection on LP-Sasakian manifolds and to find some properties of LP-Sasakian manifolds with respect to this connection. Zamkovoy connection was further studied by A. M. Blaga, A. Mandal, A. Das [3, 7–9].

The Zamkovoy connection ∇^* for an n -dimensional almost contact metric manifold M equipped with an almost contact metric structure (ϕ, ξ, η, g) consisting of a $(1, 1)$ tensor field ϕ , a vector field ξ , a 1-form η and a Riemannian metric g , is defined as

$$\nabla_X^* Y = \nabla_X Y + (\nabla_X \eta)(Y)\xi - \eta(Y)\nabla_X \xi + \eta(X)\phi Y, \quad \forall X, Y \in \chi(M), \quad (1.1)$$

where $\chi(M)$ denotes the set of all vector fields on M .

In 1989, K. Matsumoto [10] first introduced the notion of LP-Sasakian manifolds. In this context it may be mentioned that I. Mihai and R. Rosca [11] also introduced independently the notion of LP-Sasakian manifolds in 1992. The generalized recurrent manifolds was introduced by Dubey [6] and it was studied by De and Guha [4]. The ϕ -recurrent LP-Sasakian manifold was studied by A.A. Shaikh [13]. Moreover, the ϕ -concurcularly flat LP-Sasakian manifold was studied by A. Taleshian [14]. Apart from this, the properties of LP-Sasakian manifolds were studied by several authors. For instance, we see [5, 12] and their references.

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Key words and phrases: LP-Sasakian manifolds, Zamkovoy connection, concircular curvature tensor.

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Chandan J.
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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Raiganj Surendranath Mahavidyalaya
Department of Mathematics
Raiganj, Uttar Dinajpur
West Bengal, India-733134
E-mail address: abhijit4791@gmail.com


Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





Dr. Abdus Sabur


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RESEARCH ARTICLE

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Effector functions of Th17 cells are regulated by IL-35 and TGF- β in visceral leishmaniasis

Mohammad Asad^{1,2}  | Abdus Sabur^{1,3} | Mohd Kamran¹ | Md. Shadab^{1,4} |
Sonali Das¹ | Nahid Ali¹

¹Infectious Diseases and Immunology Division, Indian Institute of Chemical Biology, Kolkata, India

²Department of Medicine, Albert Einstein College of Medicine/ Montefiore Medical Center, 1300 Morris Park Avenue, Bronx, NY 10461, USA

³Raiganj Surendranath Mahavidyalaya, Affiliated to University of Gour Banga, Uttar Dinajpur, Raiganj, West Bengal 733134, India

⁴Department of Pediatrics, University of Rochester Medical Center, 601 Elmwood Avenue, Rochester, NY 14642, USA

Correspondence

Nahid Ali, Infectious Diseases and Immunology Division, Indian Institute of Chemical Biology, 4, Raja S.C. Mullick Road, Jadavpur, Kolkata, West Bengal 700032, India.
Email: nali@iicb.res.in

Funding information

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Abstract

Visceral leishmaniasis (VL) is a debilitating human pathogenesis in which the body's immune functions are severely compromised. Various subsets of T cells, including Th17 cells are important regulators of immune responses observed in various pathologies. The role of Th17 cells and its correlation with immuno-regulatory cytokines are however not well understood in human VL. Herein we studied how IL-17 is associated with the progression of *Leishmania donovani* infection using murine model of VL. We found induction of a strong IL-17 response at the early phase of infection which progressively reduced to basal level during chronic VL. The mechanistic study of this behavior was found to be linked with the role of regulatory T cells (CD4⁺CD25⁺ T cells) that suppresses the proliferation of the Th17 cell population. Moreover, TGF- β and IL-35 derived from CD4⁺CD25⁺ T cells are the key mediators for the downregulation of IL-17 during chronic VL. Thus, this study points to an antagonistic effect of Tregs and Th17 cells that can be used for designing better therapeutic and preventive strategies against leishmaniasis.

KEYWORDS

IL-35, immune suppression, immune therapy, leishmania, regulatory T cells, TGF- β , Th17

Abbreviations: CFSE, carboxyfluorescein succinimidyl ester; IFN- γ , interferon gamma; IL, interleukin; Lag, leishmanial antigen; LDA, limiting dilution assay; LDU, Leishman-Donovan units; MCP-1, monocyte chemoattractant protein-1; NO, nitric oxide; ROR γ t, retinoic-related orphan receptor gamma-t; TGF- β , transforming growth factor beta; Th1, T helper type 2 cells; Th17, T helper type 17 cells; TNF- α , tumor necrosis factor alpha; Treg, regulatory T cells.

Mohammad Asad and Abdus Sabur are Co-first Authors.

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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LP-SASAKIAN MANIFOLDS EQUIPPED WITH ZAMKOVY CONNECTION AND CONHARMONIC CURVATURE TENSOR

Abhijit Mandal¹, Ashoke Das²

¹Raiganj Surendranath Mahavidyalaya, Raiganj,
Uttar Dinajpur, West Bengal, India-733134.
Email: abhijit4791@gmail.com

²Raiganj University, Raiganj, Uttar Dinajpur,
West Bengal, India-733134.
Email: ashoke.avik@gmail.com

Abstract. The paper concerns with some results on conharmonically flat, quasi-conharmonically flat and ϕ -conharmonically flat LP-Sasakian manifolds with respect to Zamkovoy connection. Also, it contains study of generalized conharmonic ϕ -recurrent LP-Sasakian manifolds with respect to Zamkovoy connection. Moreover, the paper deals with LP-Sasakian manifolds satisfying $\mathcal{K}^*(\xi, U) \cdot R^* = 0$, where \mathcal{K}^* denotes conharmonic curvature tensor and R^* denotes Riemannian curvature tensor with respect to Zamkovoy connection, respectively.

Key words and Phrases: LP-Sasakian manifold, Zamkovoy connection, Conharmonic curvature tensor

1. INTRODUCTION

In 1989, K. Matsumoto [13] first introduced the notion of Lorentzian para-Sasakian manifolds (briefly, LP-Sasakian manifolds). Also, in 1992, I. Mihai and R. Rosca [14] introduced independently the notion of Lorentzian para-Sasakian manifolds in classical analysis. The generalized recurrent manifolds was introduced by Dubey [8] and it was studied by De and Guha et al. [6]. In this context, ϕ -recurrent LP-Sasakian manifold was first studied by A. A. Shaikh, D. G. Prakasha and Helaluddin Ahmad [15]. On the other hand, ϕ -conharmonically flat LP-Sasakian manifold was introduced by A. Taleshian [16]. Apart from these, the properties of LP-Sasakian manifolds were studied by several authors, namely U. C. De [7], C. Ozgur [17] and many others.

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhinandan Das

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Book Reviews

By studying objects, images and writings left behind by participants and observers and investigating the 'fragile hope' embedded in these productions, this monograph has unearthed a rich resource for those interested in the hidden and forgotten facets of the First World War's links with colonial India. The lives, memories and contemporary responses obscured by time have been painstakingly collected and surveyed. Their haunting quality and resonance are perhaps best captured in these lines of a Punjabi folksong by women quoted at the beginning of the book: 'The war pains me like hot sand in a cauldron/ every household now has widows.' By unraveling the cultural imprints of chaos, ravages and pain in the wake of a conflict between colonial powers more than 100 years ago, this book enriches our understanding of the war and those who bore its burdens. It arrives at a time when the most powerful states of the planet continue to pursue the goals of imperialism and millions die as a result from Afghanistan to Yemen.

Suchetana Chattopadhyay
Jadavpur University (Kolkata)

Suchetana Chattopadhyay, *Voices of Komagata Maru: Imperial Surveillance and Workers from Punjab in Bengal*, Tulika Books, New Delhi, 2018, xxi – 178, Rs. 575 (Hardback), ISBN: 978-81-934015-8-3.

On the eve of the World War I Calcutta was not only a commercial passage of the British Empire, but an important centre of colonial authority of surveillance and practicing repressive policies to secure imperial interest. As a hotbed of colonial capital in Eastern India and connected with global markets it also attracted migratory labour forces from all over South Asia that gave the area a multicultural identity. This cosmopolitan character of Calcutta and its hinterland also shaped the political identity of this region in where anti-colonial protest of underground revolutionaries led by the middle class Bengali *bhadralok* community intermingled with the struggle of poor migrant labourers. During the early war-time era in Bengal, Punjabi Sikh migrant passengers of the *Komagata Maru* were massacred upon arrival due to colonial repression and racial discrimination – 21 of them including some local inhabitants were shot dead by the British troops; several were arrested and some kept under surveillance in the coming decades also. This single event played a vital role in instigating various forms of anti-colonial and anti-capitalist resistance in India throughout the 1920s and 1930s. The existing scholarships on the Ghadar movement or the *Komagata Maru* incident have neglected this historiographic thread of colonial repression and emergence of Punjabi people's resistance from below in Bengal. In the backdrop of the *Komagata Maru* incident, this monograph traces the way in which trans-regional surveillance and repression of the Empire from above and its counter resistance from below connected the Bengal hinterland with Punjab, East Asia and North America.

Chandan Das
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur

(Affiliated to University of Gour Banga, Malda)

Recognized by UGC U/S 2f & 12(B)

NAAC accredited College with "B+" Grade (December, 2016)

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Book Reviews

broke from their elitist confinement and tried to forge links with the Ghadar and pan-Islamist organizations, the Punjabi Sikh activists, in turn, used the network of underground revolutionary activism, *gurudwaras* and neighbourhood communities to resist British oppression. Thus, a pan-nationalist revolutionary network was gradually emerging which played a crucial role in the anti-colonial movement during wartime and in the post-war period.

The fourth chapter is an account of the forgotten memory of active participation of Punjabi Sikh inhabitants of Calcutta and its hinterland in working class movements and left politics of post-war Bengal. Here the author traces how personal memory of imperial racism and repression of Gurdit Singh and other activists who travelled on *Komagata Maru* influenced the collective memory of the working class people irrespective of religious identity and prompted them to join hands against anti-imperialist and anti-capitalist agitation throughout the late colonial period.

By way of conclusion, Chattopadhyay successfully traces the inter-connections between the passage of the Punjabi Sikh migratory workforce, uprooted by the colonial land revenue policy, memory of their miseries, colonial repression and also formation of collective resistance of these migrants. This study represents an alternative historiographical account, completely different from the popular narrative which portrayed the migrant Punjabi Sikh workforce of Bengal either as a martial race, loyal to the colonial authority or a trouble making rioting community. Through this alternative narrative Chattopadhyay upholds the development of political consciousness among the migrant minority as a working class diaspora and their collective resistance alongside other working people irrespective of caste and religion for better wages and livelihood, and transformation of their political self from Ghadar inspired anti-colonial mobilization to the left-leaning revolutionary consciousness and communist internationalism that led to the formation of political branch organizations like *Kirti Dal* and *Naujawan Bharat Sabha* in Bengal. The incident of *Komagata Maru* was pivotal in this transformation.

Overall, this is a classic example of historical research exploring unaddressed historical narrative from below, which connects many events of global with local, everyday memory with *longue duree*. It deals with archival materials and other secondary sources unused so far. Use of various rare archival photographs gives an extra weight; through them readers can feel the essence of a forgotten memory of rebels and their habitat in the past century. The work must be regarded as an insightful research mapping a neglected terrain of historiography triggered by a traumatic event of colonialism's violent history. Chattopadhyay opens up aspects of diaspora studies and people's history of late colonial Bengal which could be a great resource for future researchers.

Abhinandan Das

University of Gour Banga, India

Chandan J
Prtnclpal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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REVIEW

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Metal-free multicomponent approach for the synthesis of propargylamine: a review

Sujit Ghosh *^a and Kinkar Biswas *^b

Propargylamines are important classes of alkyne coupled amine compounds used in heterocyclic chemistry and pharmaceuticals chemistry and have a large impact as a pharmacophore used in medicinal chemistry. One of the straightforward approaches for the synthesis of this class of compound is A3 coupling, a three-component coupling reaction among aldehyde, alkyne (terminal acetylene) and amine. However, there are many methods other than conventional three component alkyne–aldehyde–amine (A3) coupling which have also been reported for the synthesis of propargylamine. Most of these methods are based on the metal catalyzed activation of terminal alkyne. From the perspective of green and sustainable chemistry, the scientific community should necessarily focus on metal-free techniques which can access a variety of propargylamines. There are only a few reports found in the literature where propargylamines were successfully synthesized under metal-free conditions. This present review article neatly and precisely encompasses the comprehensive study of metal-free protocols in propargylamine synthesis putting forth their mechanisms and other aspects.

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1. General introduction

Propargylamines are important classes of organic scaffolds,¹ and have significant importance as intermediates for the synthesis of multifunctional amino derivatives,² natural

products,³ as well as biologically active compounds.⁴ Asymmetric propargylamines are important precursors for the synthesis of many drug molecules.⁵ Annulation, cyclization and cascade transformation of various derivatives of propargylamine lead to the formation of miscellaneous heterocyclic compounds,⁶ such as pyrroles,⁷ pyrrolines,⁸ pyrrolidine,⁹ pyrazines,¹⁰ pyrazoles,¹¹ thiazoles,¹² thiazolidines,¹³ isoxazoles,¹⁴ oxazolidines,¹⁵ pyridines,¹⁶ dihydropyridines,¹⁷ etc.

Among the various methods of its synthesis, metal catalytic A3 coupling reaction,¹⁸ is the major one. One-pot three-

^aDepartment of Chemistry, Raiganj Surendranath Mahavidyalaya, Raiganj 733134, India. E-mail: sujit2484@gmail.com

^bDepartment of Chemistry, Raiganj University, Raiganj 733134, India. E-mail: kinkar.chem@gmail.com



Dr Sujit Ghosh received his M.Sc. degree in Chemistry with specialization in organic chemistry (2007) from University of North Bengal, India. Afterwards, he joined the group of Prof. Basudeb Basu at University of North Bengal as a doctoral student. His doctoral work was based on the various 'greener approaches' towards organic transformations using transition metal catalysts and

eco-friendly reaction media. Currently, he is working as an assistant professor in chemistry at Raiganj Surendranath Mahavidyalaya, India. The area of various fields of his research interest is development of greener reaction methodology, organic synthesis, designing new organic molecules and organometallic reactions.



Dr Kinkar Biswas completed his M.Sc. degree in chemistry with specialization in organic chemistry (2007) from University of North Bengal, India. Later, he joined the group of Prof. Basudeb Basu at University of North Bengal as a doctoral student. His doctoral work was based on the development of organic synthetic methodology using various green approaches.

At present, he is working as an assistant professor in chemistry at Raiganj University, India. His current research area is mainly comprised of transition metal catalyzed organic synthesis under benign reaction conditions and the design of various organic sensor molecules.

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhijit Mandal

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PROJECTIVE CURVATURE TENSOR WITH RESPECT TO ZAMKOVY CONNECTION IN LORENTZIAN PARA-SASAKIAN MANIFOLDS

ABHIJIT MANDAL¹, ASHOKE DAS²

¹Raiganj Surendranath Mahavidyalaya, Raiganj,
Uttar Dinajpur, West Bengal, India,

Email: abhijit4791@gmail.com

²Raiganj University, Raiganj, Uttar Dinajpur,
West Bengal, India,

Email: ashoke.avik@gmail.com

Abstract. The purpose of the present paper is to study some properties of Projective curvature tensor with respect to Zamkovoy connection in Lorentzian Para Sasakian manifold (briefly, LP-Sasakian manifold). We obtain some results on Lorentzian Para-Sasakian manifold with the help of Zamkovoy connection and Projective curvature tensor. Moreover, we study the LP-Sasakian manifold satisfying $P^*(\xi, U) \circ W_0^* = 0$ and $P^*(\xi, U) \circ W_2^* = 0$, where P^* , W_0^* and W_2^* are Projective curvature tensor, W_0 -curvature tensor and W_2 -curvature tensor with respect to Zamkovoy connection respectively.

Key words and Phrases: LP-Sasakian manifolds, Zamkovoy Connection, Projective Curvature tensor

1. INTRODUCTION

In 1989, K. Matsumoto [7] first introduced the notion of Lorentzian Para-Sasakian manifolds. Also, in 1992, I. Mihai and R. Rosca [8] introduced independently the notion of Lorentzian Para Sasakian manifolds (briefly, LP-Sasakian Manifolds) in classical analysis. In an n -dimensional metric manifold the signature of the metric tensor is the number of positive and negative eigenvalues of the metric. If the metric has s positive eigenvalues and t negative eigenvalues then the signature of the metric is (s, t) . For a non-degenerate metric tensor $s + t = n$. A Lorentzian manifold is a special case of a semi Riemannian manifold, in which

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Chandan J.
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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ON M-PROJECTIVE CURVATURE TENSOR OF SASAKIAN MANIFOLDS ADMITTING ZAMKOVY CONNECTION

ABHJIT MANDAL¹ AND ASHOKE DAS

ABSTRACT. The purpose of the present paper is to study some properties of Sasakian manifold admitting Zamkovoy connection. We study M -Projectively flat, as well as ϕ - M -Projectively flat Sasakian manifolds admitting Zamkovoy connection. Moreover, we discuss locally M -Projectively ϕ -symmetric Sasakian manifold with respect to Zamkovoy connection. Besides these, we discuss Sasakian manifolds satisfying $\overline{M}(\xi, U)\circ\overline{R} = 0$, where \overline{M} and \overline{R} are M -Projective curvature tensor and Riemannian curvature tensor with respect to Zamkovoy connection respectively.

1. INTRODUCTION


The notion of Sasakian structure [12] was introduced by Japanese mathematician S. Sasaki in the year 1960. If a contact metric manifold is normal then the manifold is said to be a Sasakian manifold. In some respect, Sasakian manifolds may be viewed as an odd dimensional analogues of Kähler manifolds.

In 1971, Pokhariyal and Mishra [9] introduced the notion of M -Projective curvature tensor on Riemannian manifold. Properties of the M -projective curvature tensor in Sasakian manifolds were studied by R.H. Ojha [7]. Also, in [11], R.H. Ojha studied some properties of M -Projective curvature tensor in

¹corresponding author

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Key words and phrases. Sasakian Manifold, M-Projective Curvature tensor, Zamkovoy Connection.


Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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A. MANDAL AND A. DAS

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DEPARTMENT OF MATHEMATICS

RAIGANJ SURENDRANATH MAHAVIDYALAYA

RAIGANJ, UTTAR DINAJPUR, WEST BENGAL, INDIA


Email address: abhijit4791@gmail.com

DEPARTMENT OF MATHEMATICS

RAIGANJ UNIVERSITY

RAIGANJ, UTTAR DINAJPUR, WEST BENGAL, INDIA

Email address: ashoke.avik@gmail.com


Principle
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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PSEUDO PROJECTIVE CURVATURE TENSOR ON SASAKIAN MANIFOLDS ADMITTING ZAMKOVY CONNECTION

ABHIJIT MANDAL¹ AND ASHOKE DAS²

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Abstract. The purpose of the present paper is to study some properties of Sasakian manifolds admitting Zamkovoy connection. In this paper we obtain expressions for pseudo projective curvature tensor (\bar{P}^*), Riemannian curvature tensor (R^*), Ricci tensor (S^*), Ricci operator (Q^*) and scalar curvature (r^*) with respect to Zamkovoy connection in Sasakian manifold. We also study pseudo projectively flat, quasi pseudo projectively flat and ϕ -pseudo projectively flat Sasakian manifolds admitting Zamkovoy connection. Moreover, we study generalized pseudo projective ϕ -recurrent Sasakian manifolds with respect to Zamkovoy connection. Besides these, we discuss Sasakian manifolds satisfying $\bar{P}^*(\xi, X) \circ R^* = 0$, where \bar{P}^* denotes pseudo projective curvature tensor and R^* denotes Riemannian curvature tensor with respect to Zamkovoy connection respectively.

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Key words and phrases : Sasakian manifolds, Zamkovoy connection, pseudo projective curvature tensor.

1. Introduction. Sasakian manifold (Sasaki, 1960) with Riemannian metric was defined by Japanese mathematician S. Sasaki in the year 1960. Sasaki manifolds may be viewed as an old dimensional analogue of Kähler manifolds. This manifold was further studied by several authors, namely B. P. Charles, James Sparks, Shing-Tung Yau, Z. Olszak, M. C. Chaki and M. Tarafdar (Boyer and Galicki, 1999, Dario, James and Shing-Tung, 2008, Olszak, 1978 and Chaki and Tarafdar, 1990).

In Riemannian manifold of dimension $n > 2$, the pseudo projective curvature tensor was introduced by B. Prasad (Prasad, 2002) in 2002. In 2011, H. G. Nagarjuna and G. Somashekhara showed that every pseudo projectively flat and pseudo projective semi symmetric Sasakian manifolds are locally isomorphic to unit sphere. The properties

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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ABHIJIT MANDAL AND ASHOKE DAS


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¹DEPARTMENT OF MATHEMATICS
RAIGANJ SURENDRANATH MAHAVIDYALAYA
RAIGANJ, UTTAR DINAJPUR, WEST BENGAL
INDIA

E-MAIL : abhijit4791@gmail.com

²DEPARTMENT OF MATHEMATICS
RAIGANJ UNIVERSITY
RAIGANJ, UTTAR DINAJPUR, WEST BENGAL
INDIA

E-MAIL : ashoke.avik@gmail.com


Principial
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
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Dr. Rakhee Das Biswas

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Research Article

Immunodetection of *Alternaria alternata* and Evaluation of Antifungal Compounds in Tea Leaf Tissues Following Challenge Inoculation with Pathogen

Rakhee Das Biswas¹ and Bishwanath Chakraborty²

¹Department of Botany, Raiganj Surendranath Mahavidyalaya, Raiganj – 733 134; ²Department of Biological Sciences, Aliah University, New Town, Kolkata – 700 156; E-mail: bncnbu@gmail.com

Abstract

Varietal resistant test of tea against *Alternaria alternata* was done following whole plant inoculation technique. Among the ten tea varieties tested, four were found to be highly resistant, four were highly susceptible and rest two were moderately resistant. Polyclonal antibody (PAb) raised against mycelial antigens of *A. alternata* and IgG was purified by ammonium sulphate precipitation and DEAE – Sephadex column chromatography. Effectiveness of raising antibody against the pathogen was confirmed by agar-gel double diffusion test and optimization of antigen and antibody concentrations was done using PTA-ELISA format. The pathogen could be detected in leaf tissues following inoculation with *A. alternata* using PTA-ELISA and dot immunobinding assay. Cellular localization of the pathogen was also evident as bright fluorescence mainly in mesophyll tissues using PAb of *A. alternata* labeled with FITC. Catechin extracted from healthy and infected tea leaves were compared by HPLC. A corresponding decrease in EGCG, and increase in GC, EPC, GCG and ECG were observed. Antifungal compounds isolated from healthy and *A. alternata* inoculated tea leaves exhibited clear inhibition zone at R_f 0.65 in chromatographic bioassay. On the basis of their colour reaction on TLC and UV-spectra compound was identified to be pyrocatechol. Resistant varieties accumulated 497-573 $\mu\text{g/g}$ fresh wt tissue and susceptible varieties accumulated 257-286 $\mu\text{g/g}$ fresh wt tissue of pyrocatechol respectively, after 48h after inoculation with *A. alternata*, while a low concentration (69-110 $\mu\text{g/g}$ fresh tissue) of this compound was detected in healthy leaf tissue.

Key words: *Alternaria alternata*, catechin, DIBA, indirect immunofluorescence, PTA-ELISA, pyrocatechol, tea

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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Arise ! Awake ! And stop not till the goal is reached. -Swami Vivekananda

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Department of Botany, University of Calcutta,
Taraknath Palit Siksha Prangan,
35, Ballygunge Circular Road, Kolkata 700 019, India

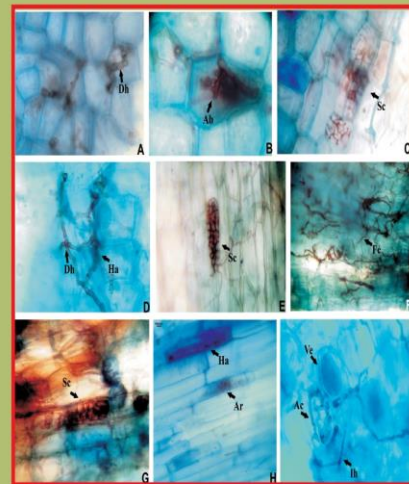
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Chandan J
Principal
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RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

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University of Calcutta, Kolkata 700 019, India

Root colonization with Arbuscular mycorrhizal fungi and Dark septate Endophytes in Tea plants

RAKHEE DAS BISWAS¹, UTANKA KUMAR DE² AND BISHWANATH CHAKRABORTY^{3*}

¹Department of Botany, Raiganj Surendranath Mahavidyalaya, Raiganj 733134

²Department of Botany, University of North Bengal, Siliguri 734 130

³Department of Biological Sciences, Aliah University, New Town, Kolkata

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Root colonization with arbuscular mycorrhizal fungi (AMF) and dark septate endophyte (DSE) were studied in fifteen tea varieties, of which six UPASI varieties (UP-2, UP-3, UP-8, UP-9, UP-26 and BSS-2) and nine Tocklai varieties (TV-18, TV-9, T-17, TV-22, TV-23, TV-25, TV-26, TV-29 and TV-30) being grown in Tea Germplasm Bank (15 year old bush in experimental field) of Department of Botany, University of North Bengal. The physical nature of arbuscules, vesicles, intraradical hyphae and dark septate endophyte associations were studied extensively to determine the colonization impact of these tea varieties. Highest percentage of root colonization (86-88%) were noticed in some UPASI varieties of which biconal seed stock (BSS-2) yielded highest root colonization. Besides, among nine Tocklai tea varieties tested, TV-29 yielded highest (87%) root colonization. Paris type hyphae are abundant in all the varieties that come from *Glomus* sp. along with some coiled arbuscular structure that proves the infections of some *Gigaspora* species. The mycelium of dark septate endophyte (DSE) was observed in all the tea varieties but most extensively was in BSS-2, UP-3, UP-8, TV-18, T-17, TV-22 and TV-26.

Key words : Arbuscular mycorrhizal fungi, dark septate endophyte, *Glomus*, *Gigaspora*, root colonization.

INTRODUCTION

Tea (*Camellia sinensis* (L.) O. Kuntze.), is the major plantation crop of North- East India and forms the backbone of the economy of this region. It is a perennial and survives for more than 100 years. After water, tea is the most widely consumed beverage in the world. Tea contains catechins, a type of antioxidant. In a freshly picked tea leaf, catechins can comprise up to 30% of the dry weight. Catechins are highest in concentration in white and green teas, while black tea has substantially fewer due to its oxidative preparation. It has a cooling, slightly bitter, astringent flavour which is enjoyed by many people. The major tea growing areas of India are Darjeeling, Terai and Dooars of West Bengal, Assam and Nilgiri (Kerala and Tamil Nadu). The high quality and distinct flavour and aroma of Darjeeling tea is a result of unique climate, soil, altitude and processing methods prevalent in Darjeeling. In tea plantations, with the reduction in the permissible levels of chemicals which can be

used, there is urgent need for identification and selection of beneficial microbes which have the potential to control diseases and also increase productivity. Arbuscular mycorrhizas are by far the most prevalent of all mycorrhizal categories with more than 80% of all plant species showing an association involving a few fungal genera in the Glomeromycota. Mycorrhizas increase nutrient uptake from the soil. Also it can be used in the biocontrol of pathogenic fungi and nematodes (Chakraborty, 2019). Dark septate endophytes (DSE) are a group of hetero-geneous endophytic fungi which are characterized by melanized hyphae within plant roots. Critically the role of DSE is still not understood. The occurrence of arbuscular mycorrhizal fungi and association of dark septate endophytes in tea root system of Darjeeling, Tocklai and UPASI varieties are discussed in the present study.

MATERIALS AND METHODS

Host Plants

Fifteen tea varieties, of which six UPASI varieties (UP-2, UP-3, UP-8, UP-9, UP-26 and BSS-2) and

*Corresponding author: bncnbu@gmail.com

Chandan B
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Rakhee Das Biswas

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© Botanical Society of Bengal, Department of Botany,
University of Calcutta, Kolkata 700 019, India

FULL LENGTH ARTICLE

Evaluation of leaf extracts of *Azadirachta indica*, *Catharanthus roseus* and *Diplazium esculentum* on tea plants for induction of resistance against *Alternaria alternata*

Rakhee Das Biswas¹ and Bishwanath Chakraborty^{2,*}

¹Department of Botany, Raiganj Surendranath Mahavidyalaya, Uttar Dinajpur -733134

²Department of Biological Sciences, Aliah University, New Town, Kolkata - 700156

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Among the ten tea varieties tested for screening of disease resistance against *A. alternata*, Teen Ali 17/1/54 showed most susceptible reaction towards the pathogen. Foliar application of aqueous leaf extracts of three selected plants (*Azadirachta indica*, *Catharanthus roseus* and *Diplazium esculentum*) on tea plants (Teen Ali 17/1/54) were evaluated against *Alternaria* blight disease. Reduction in disease incidence by application of these extracts was evident. The level of defense enzymes such as phenylalanine ammonia lyase, chitinase and β -1, 3-glucanase following challenge inoculation of ten tea varieties with *A. alternata* were determined. Time course accumulation of these defense enzymes were found to be higher in untreated inoculated plants in comparison to untreated healthy plants and increased accumulation of all three defense enzymes were further noticed in treated inoculated tea plants in comparison to treated healthy plants. Indirect immunofluorescence studies revealed that tea leaf tissue exhibited high level of chitinase deposition mainly in the mesophyll tissues following treatment with aqueous leaf extracts of *A. indica*, *C. roseus* and *D. esculentum*. The investigation support the hypothesis that plant extract may induce indirectly defense reactions in tea plants towards the foliar fungal pathogen.

Key words: *Camellia sinensis*, *Alternaria alternata*, plant extract, *Azadirachta indica*, *Catharanthus roseus*, *Diplazium esculentum*, induced resistance.

INTRODUCTION

Tea [*Camellia sinensis* (L.) O. Kuntze] is one of the most important plants from the economic viewpoint and being a perennial is always challenged by pests and pathogens. *Alternaria* blight, a foliar disease of tea caused by *Alternaria alternata* (Fr.) Keissler is very common in the nursery grown plants (Fig. 1). Disease symptoms appear as greyish brown patches on the

young leaves. Older leaves were less susceptible. Symptoms first appear in the tip region and the margin of the leaves, which extend towards the midrib following which the leaves curl, and die. It causes serious infection leading defoliation of leaves. It causes considerable damage to the plants maintained in the nursery as well as in the field (Chakraborty *et al.*, 2006).

Integrated plant disease management has been considered as a holistic approach keeping in view the agroecological system and the overall situation of

*Corresponding author : bncnbu@gmail.com

Teacher in Charge
Raiganj Surendranath Mahavidyalaya

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





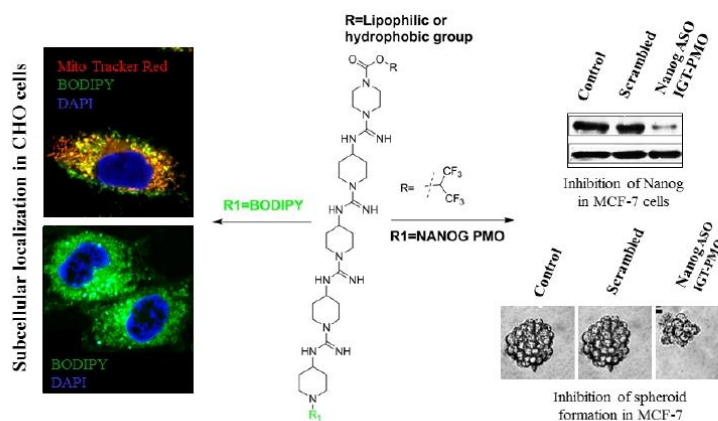
Dr. Priyanjalee Banerjee

Internal Oligoguanidinium Transporter: Mercury Free Scalable Synthesis, Improvement of Cellular Localization, Endosomal Escape, Mitochondrial Localization and Conjugation with Antisense Morpholino for NANOG Inhibition to Induce Chemosensitization of Taxol in MCF-7 Cells

Jayanta Kundu,[†] Priyanjalee Banerjee,^{†,‡} Chandra Bose,[†] Ujjal Das,[†] Ujjwal Ghosh[†] and Surajit Sinha^{*,†}

[†]School of Applied and Interdisciplinary Sciences, Indian Association for the Cultivation of Science, Jadavpur, Kolkata 700032, West Bengal, India.

[‡]Present Address: Assistant professor at Raiganj Surendranath Mahavidyalaya, Raiganj, W.B, India.



ABSTRACT: A non toxic delivery vehicle is essential for the therapeutic applications of antisense phosphorodiamidate morpholino oligonucleotides (PMOs). Though guanidinium rich or arginine rich cellular transporter conjugated Vivo-PMO or PPMO has been developed for in vivo application, however, either their toxicity or stability has become an issue. Previously we reported non-peptidic internal guanidinium transporter (IGT) mediated delivery of PMO for gene silencing and got encouraging results. In this paper we report the synthesis of IGT using Hg-free method for scale up and N-terminal modification of IGT with a suitable hydrophobic or lipophilic group to improve the cell permeability, endosomal escape, mitochondrial localization and to reduce toxicity in MTT assay. For the delivery of PMO, IGT-PMO conjugate was synthesized to target *NANOG* in cells, a transcription factor required for cancer stem cell proliferation and embryonic development and is involved in many cancers. Our data shows IGT-PMO-facilitated *NANOG* inhibition and thereby the prevention of EpCAM-N-Cadherin-Vimentin axis mediated epithelial to mesenchymal transition (EMT) in MCF-7 cells. Moreover, unlike taxol, *NANOG* inhibition influences the expression of stemness factor c-Myc, Hh-Gli signaling proteins, other cancer related factors and their respective phenotypes in cancer cells. To the best of our knowledge, this is the first report to illustrate that the IGT-PMO-mediated *NANOG* inhibition increases the therapeutic potential of taxol and induces G0-G1 arrest in cancer cells to prevent the cancer progression. However, it warrants further investigations in other cancer cells and preclinical platforms.

INTRODUCTION

Phosphorodiamidate morpholino oligomers (PMO, 20-25mer) (Figure 1a)¹ are routinely used for gene silencing where they

are designed to be complementary to the 5' leader sequences or to the first 25 bases of 3' to the AUG translational start site, and they act by steric blocking mechanism². Their neutral backbone, nuclease stability, long-term activity, water solu-



Biological Chemistry & Chemical Biology

Evaluation of a Tubulin-Targeted Pyrimidine Indole Hybrid Molecule as an Anticancer Agent

Chandra Bose,^[a] Priyanjalee Banerjee,^[a] Jayanta Kundu,^[a] Biswadeb Dutta,^[a] Indranil Ghosh,^[b] Shreya Sinha,^[a] Argha Ghosh,^[b] Abhishek Barua,^[b] Shalini Gupta,^[a] Ujjal Das,^[a] Siddhartha S. Jana,^[b] and Surajit Sinha*^[a]

Several small molecules targeting microtubule dynamics have been developed because microtubules are considered to be one of the most successful cancer chemotherapeutic targets. In this regard, taxol is most worthy to mention which stabilizes microtubule polymer thereby causing defects in mitotic spindle assembly, chromosome segregation and cell division resulting in cancer inhibition. In this direction, we have earlier reported a small molecule called Pyrimidine-Indole-Hybrid (PIH (P)) which was found to inhibit ciliogenesis by inhibiting both the acetylation and polymerization of tubulin subunits. Here, we have evaluated the anticancer activities of PIH (P) and its water soluble derivatives. Three water soluble derivatives of PIH (P) namely 6A, 6B and 6C were synthesized. Among PIH (P) series

of compounds, PIH (P) and 6C were found to be the most potent compounds showing anti-proliferative and cytoskeletal disrupting activities against MCF-7 cells. Not only that, PIH (P) and 6C also showed a promising effect in preventing cancer cell migration, invasion and colony-formation and helped to reduce spheroid formation by several-folds. They have potential to inhibit the activity of proteins (N-Cadherin, Vimentin) responsible for Epithelial to Mesenchymal Transition (EMT). Hence, this class of compound could be a new antimetastatic agent that is different from taxol with respect to mechanism, particularly by destabilizing tubulin rather than causing stabilization.

1. Introduction

Microtubules along with microfilaments and intermediate filaments form the cytoskeleton of cell which regulates cell growth, movement and homeostasis.^[1-4] Alterations in the expression of tubulin isotypes, microtubule-associated proteins (MAPs) and the post-translational modifications of tubulin lead to a wide variety of cancers and at the same time these changes are also known to influence drug resistance.^[4,5] In this context it is worthy to mention that increased acetylation of α tubulin has been observed in cancer.^[6] With the understanding of microtubule-based signaling pathways involved in cancers, a multi targeted therapy^[7] or mitosis-specific agents^[8] might be more coherent to eliminate cancer cells efficiently and also to limit the possibilities of drug resistance. In this regard, many small molecules have emerged as potential cancer treatment strategies as they are less expensive and more convenient to administer.^[3,7,9-14] The most well-known anti mitotic drug, Taxol, has been found to stabilize microtubule polymerization, thereby

causing defects in mitotic spindle assembly, chromosome segregation, cell division and also can activate non-cancerous cells of the immune system all of which leads to cancer inhibition.^[15-18] In our laboratory, the mechanism of action of a small molecule based on pyrimidine indole hybrid (PIH (P)) structure was delineated and found to inhibit ciliogenesis by inhibiting the polymerization of tubulin subunits.^[19] This result encouraged us to study the anticancer activity of PIH (P). For any drug to achieve the required pharmacological response, one of the important parameters to be taken into consideration is its solubility in water. In this paper, we report the synthesis of water soluble derivatives of PIH (P) and evaluate their anticancer activities through the inhibition of acetylated α -tubulin and other tumor inducing proteins in MCF-7 cells.

2. Results and Discussion

2.1. Chemistry

Our earlier report^[19] suggested that substitution can be incorporated very easily at 1 or 2- position of indole in PIH (P) without changing much in the biological activity. Accordingly, for the synthesis of water soluble derivatives of PIH (P) we then decided to incorporate water soluble moiety in the indole part at this position keeping the hydrazine part of the molecule intact. Following the previously reported protocol the hydrazine pyrimidine derivative (5) was synthesized and characterized by X-ray crystal analysis (Supplementary figure S1). We chose triethylene glycol monomethyl ether as water

[a] C. Bose, Dr. P. Banerjee, J. Kundu, B. Dutta, S. Sinha, S. Gupta, Dr. U. Das, Prof. S. Sinha
School of Applied and Interdisciplinary Sciences, Indian Association for the Cultivation of Science,
Jadavpur, Kolkata 700032,
E-mail: ocss5@iacs.res.in

[b] I. Ghosh, A. Ghosh, A. Barua, Prof. S. S. Jana
School of Biological Sciences, Indian Association for the Cultivation of Science, Jadavpur, Kolkata 700032, India

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RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)



PARASITOLOGY



Evaluation of Cysteine Protease C of *Leishmania donovani* in Comparison with Glycoprotein 63 and Elongation Factor 1 α for Diagnosis of Human Visceral Leishmaniasis and for Posttreatment Follow-Up Response

Nicky Didwania,^a Sarfaraz Ahmad Ejazi,^a Rudra Chhajer,^a Abdus Sabur,^{a*} Saumyabrata Mazumder,^{a*} Mohd Kamran,^a Raunak Kar,^{a*} Krishna Pandey,^b Vidya Nand Ravi Das,^b Pradeep Das,^c Mehebubar Rahaman,^d Rama Prosad Goswami,^d Nahid Ali^a

^aInfectious Diseases and Immunology Division, CSIR-Indian Institute of Chemical Biology, Kolkata, India

^bDepartment of Clinical Medicine, Rajendra Memorial Research Institute of Medical Sciences, Patna, India

^cDepartment of Molecular Biology, Rajendra Memorial Research Institute of Medical Sciences, Patna, India

^dDepartment of Tropical Medicine, School of Tropical Medicine, Kolkata, India

ABSTRACT Visceral leishmaniasis (VL) is a threat in many developing countries. Much effort has been put to eliminating this disease, for which serodiagnosis remains the mainstay for VL control programs. New and improved antigens as diagnostic candidates are required, though, as the available antigens fail to demonstrate equal optimum performance in all areas of endemicity. Moreover, these diagnoses are dependent on invasive serum sampling. In the current study, we cloned and expressed *Leishmania donovani* cysteine protease C (CPC) and evaluated its diagnostic and test-of-cure possibilities by detecting the antibody levels in human serum and urine through ELISA and immunoblot assays. Two immunodominant antigens, recombinant glycoprotein 63 (GP63) and elongation factor 1 α (EF1 α), identified earlier by our group, were also assessed by employing human serum and urine samples. Of these three antigens in ELISAs, CPC demonstrated the highest sensitivities of 98.15% and 96% positive testing in serum and urine of VL patients, respectively. Moreover, CPC yielded 100% specificity with serum and urine of nonendemic healthy controls compared to GP63 and EF1 α . Urine samples were found to be more specific than serum for distinguishing endemic healthy controls and other diseases by means of all three antigens. In all cases, CPC gave the most promising results. Unlike serum, urine tests demonstrated a significant decrease in antibody levels for CPC, GP63, and EF1 α after 6 months of treatment. The diagnostic and test-of-cure performances of CPC in the immunoblot assay were found to be better than those of GP63 and EF1 α . In conclusion, CPC, followed by GP63 and EF1 α , may be utilized as candidates for diagnosis of VL and to assess treatment response.

KEYWORDS immunology, infection, diagnosis, leishmaniasis, recombinant antigens, parasitology

Leishmaniasis is a set of diseases manifested by the infection of parasites belonging to the genus *Leishmania*. The parasites are carried to the mammalian hosts by the bite of an infected female sandfly of either the genus *Lutzomyia* (New world) or the genus *Phlebotomus* (Old world) (1). More than 20 species of *Leishmania* are responsible for infecting mammals, resulting in a wide spectrum of clinical manifestations. This includes visceral leishmaniasis (VL), cutaneous leishmaniasis (CL), and mucocutaneous leishmaniasis (MCL). The most serious of all clinical forms is VL, also known as kala-azar,

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Address correspondence to Nahid Ali, nali@iicb.res.in.

* Present address: Abdus Sabur, Department of Botany, Raiganj Surendranath Mahavidyalaya, Raiganj, West Bengal, India; Saumyabrata Mazumder, Prema Biotech, Gurgaon, Haryana, India; Raunak Kar, Immunogenics Lab, National Institute of Immunology, New Delhi, India.

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Prithwiraj Jha

University of Agricultural Sciences and Veterinary Medicine Iasi

TANK SIZE AND AQUACULTURE MANAGEMENT INFLUENCE ON THE PRODUCTION OF GOLD FISH, *CARASSIUS AURATUS* (L.), UNDER TROPICAL CONDITIONS

Jha Prithwiraj^{1*}

¹Department of Zoology, Raiganj Surendranath Mahavidyalaya, West Bengal, India

Abstract

Growth performance of gold fish *Carassius auratus* (L.) produced in tanks of different size and treated under different management regimes were compared. Tanks of two different size and make were used (concrete; capacity: 2000 l and earthen; capacity: 59650 l) for four management regimes: (1) live zooplankton fed to fish larvae in concrete (CLF) and earthen tanks (ELF); (2) application of poultry manure in concrete (CPM) and earthen tanks (EPM); (3) application of cow manure in concrete (CCD) and earthen tanks (ECD); and (4) a control treatment for concrete (CC) and earthen tanks (EC). Fish larvae (0.10 ± 0.007 g) were cultured for 11 weeks. Weight gain of gold fish was highest in the ELF treatment. There was a significant difference in the survival of gold fish among the treatments, ranging from 64.83% in CC to 93.40% in ELF. Significantly higher values of pH and dissolved oxygen were obtained in the live food and control treatments (for both concrete and earthen tanks), compared to the manured treatments. The concentration of total alkalinity, BOD, $PO_4 - P$, $NO_3 - N$ and specific conductivity were significantly higher in EPM and ECD, compared to other treatments. The results indicate that introduction of live zooplankton into culture units resulted in higher growth of fish larvae. Better growth of cultured fish were obtained in larger earthen tanks compared to smaller concrete tanks through maintenance of superior water quality and greater abundance of plankton.

Key words: gold fish, management, tank size, water quality, plankton, fish production

INTRODUCTION

The international trade in ornamental fish provides employment opportunities for thousands of rural people in developing countries [5]. Every year, there are new advancements in breeding, transport and aquarium technology. In India, ornamental fish producers culture fish both in concrete and earthen tank units, as and when available, without giving proper importance to the culture requirements of the target species [11,18]. Generally, ornamental fish units in India are subjected to a wide range of management practices, from application of organic manure [14,17] to supplementary feeding [15,32] and supply of plankton [12,13,16,20,21] from exogenous sources.

There is a paucity of documentation on how experimental units themselves may affect production [6]. The limited literature available is difficult to be compared and interpreted because the experiments are done with different designs, fish, seasons, protocols etc [6]. Since any management applied would have a different effect on the interactions of water quality, phytoplankton and zooplankton, with respect to earthen and concrete tanks, it could lead to differences in survival and growth of fish produced in both systems [18]. In the present study, we examined the effect of differential aquaculture management on water quality, plankton abundance, growth and survival of gold fish *Carassius auratus* (L.) produced in earthen and concrete tanks.

MATERIAL AND METHOD

Twelve concrete (2.13 x 0.91 x 1.22 m; capacity: 2000 l each) and twelve earthen

*Corresponding author:

jhakingshuk@gmail.com

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Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
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MANAGEMENT INDUCED CHANGES IN POND WATER QUALITY AND GROWTH PERFORMANCE OF GOLDFISH, *Carassius auratus* (L.), IN TWO 11-WEEK GROWTH EXPERIMENTS CONDUCTED DURING THE SUMMER AND WINTER SEASONS

Prithwiraj JHA

Department of Zoology, Raiganj Surendranath Mahavidyalaya, Raiganj, West Bengal, India

Corresponding author email: jhakingshuk@gmail.com

Abstract

To assess the seasonal influence on the growth performance of goldfish, *Carassius auratus* (L.) in earthen ponds maintained under different production management regimes, two 11-week growth experiments were conducted during two different seasons (summer and winter) under tropical conditions in India. Weight gain, survival rate and fish deformities were compared among four management regimes in each season: (1) fish larvae fed with live zooplankton (LF); (2) direct fertilization with poultry manure (PM); (3) direct fertilization with cow dung (CD); (4) a control system (C), where a commercial diet containing 32% crude protein was applied. The LF treatment produced significantly higher weight gain and survival rate of goldfish ($P < 0.05$) in both the trials through maintenance of better water quality and greater abundance of zooplankton in the system. Fish deformities were highest in the C treatment in both the experiments. Water temperature averaged 27.5°C and 16.2°C, respectively, in the summer and the winter trials. Average weight gain and survival rates of goldfish achieved during the winter trial were considerably lower than the summer trial ($P < 0.05$).

Key words: aquaculture management, fish production, goldfish, seasonal effect, water quality.

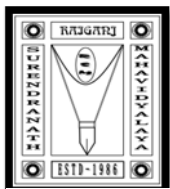
INTRODUCTION

The bulk of ornamental fishes in the international aquarium trade is of freshwater origin and is farm-raised (Livengood and Chapman, 2007). The goldfish, *Carassius auratus* (L.), is a very popular ornamental fish and has a market for individuals as small as 4 g (minimum), that typically requires only about ten weeks of growth to attain the saleable size (Jha et al., 2006a; Jha, 2017). One of the critical bottlenecks that culturists have to face is the survival of the larvae that has just made the transition from an endogenous to an exogenous feeding habit in nursery tank conditions. Now, the same larvae, which have grown to about two weeks, are stocked under intensive culture conditions for quick growth in short period. Therefore, the level of expertise required in production management, particularly with relation to water quality is higher with ornamental fish than any other type of aquaculture (Watson and Shireman, 1996). The fish are subjected to different kinds of aquaculture management that varies from farm to farm. The use of organic manures in

ornamental fish production has been documented (Jha et al., 2004; Jha and Barat, 2005a). However, using organic manure can result in negative environmental impact (Jha, 2007) and supply of exogenous live food can be an effective alternative (Jha and Barat, 2005b; Jha et al., 2006b; 2008; Jha, 2019). Fish are unable to perform de novo synthesis of carotenoids (Goodwin, 1984) and rely on costly dietary supply to achieve their natural pigmentation (Paripatananont et al., 1999), since the market value of ornamental fish increases with intensity of skin colouration (Nica et al., 2019). Since Indian farmers are generally unable to provide costly dietary supplements, they stress on the supply of live food instead. Taking advantage of the tropical climate, fish culturists in India have the opportunity to harvest multiple crops throughout the year (Jha et al., 2007) where pond water temperature falls below 20°C for only three months in a year, i.e. mid-November to mid-February.

In the present experiment, two 11-week growth trials were conducted during two different seasons (summer and winter) to assess the





Spectroscopic study of ^{38}K above the 31.67 μs isomer

Rozina Rahaman,¹ Abhijit Bisoi^{1,*}, Y. Sapkota,¹ Anik Adhikari,¹ Ananya Das,¹ S. Sarkar,¹ M. Saha Sarkar,²
A. Goswami,² S. Ray,³ M. Roy Basu,⁴ Debasmita Kanjilal,⁵ Somnath Nag,⁶ K. Selvakumar,⁷
N. Madhavan,⁸ S. Muralithar,⁸ and R. K. Bhowmik⁸

¹Indian Institute of Engineering Science and Technology, Shibpur, Howrah-711103, India

²Saha Institute of Nuclear Physics, Bidhannagar, Kolkata-700064, India

³Department of Nuclear Science and Technology, Mody University of Science and Technology, Sikar, Rajasthan-332311, India

⁴Department of Physics, University of Calcutta, Kolkata-700009, India

⁵Department of Physics, Raiganj Surendranath Mahavidyalaya, Raiganj-733134, India

⁶Indian Institute of Technology (Banaras Hindu University), Varanasi-221005, India

⁷Department of Physics, Bannari Amman Institute of Technology, Sathyamangalam-638401, India

⁸Inter-University Accelerator Centre, New Delhi-110067, India

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High-spin states of ^{38}K above the 31.67 μs (τ_m) isomer, populated through the $^{12}\text{C}(^{28}\text{Si}, np)^{38}\text{K}$ reaction with a 110 MeV ^{28}Si beam, have been studied by using the Indian National Gamma Array (INGA) facility. Two new levels and four new transitions have been added to the existing level scheme. The spins and parities of most of the levels above the isomer have been assigned, modified, and confirmed from R_{DCO} , R_{ADO} , and linear polarization measurements. The multipole mixing ratios (δ) for a few transitions have been measured. Large-basis shell-model calculations have been performed to understand the microscopic origin of these levels. In our calculations, different particle restrictions in sd - and pf -shell orbitals were used to reproduce the experimental level energies. Two-nucleon transfer spectroscopic factors have also been calculated for the levels above the isomer to support the new spin and parity assignments. Prediction of collective excitation at high excitation energy in ^{38}K is also discussed.

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I. INTRODUCTION

Nuclei in the neighborhood of doubly closed ^{40}Ca usually exhibit the characteristic of spherical single-particle excitation spectra [1] and their excitation spectra are well explained by the spherical shell model [2–7]. Recent developments of detector and data-acquisition systems made it possible to study these nuclei at higher angular momentum and excitation energy. As a result, the coexistence of single-particle and collective excitations have been observed in a few sd shell nuclei, viz., ^{40}Ca [8], ^{36}Ar [9], ^{35}Cl [10], etc. In these nuclei, the single-particle excitations are mostly dominant at low excitation energies and collective excitations in terms of normal deformed or even superdeformed (SD) bands are found at relatively higher excitation energies. Shell-model calculations with multiparticle multihole excitation have been performed successfully to understand the microscopic origin of these observed SD bands. The origin of the observed SD bands in ^{40}Ca [8], ^{36}Ar [9], ^{35}Cl [10] nuclei are explained in terms of 8p-8h [11], 4p-4h [12], and 3p-3h [10] excitations, respectively, in shell-model calculations. The presence of α -cluster structure of the states of these SD bands has already been discussed in Refs. [10,13,14]. The presence of α clusters

at low excitation energy has been predicted recently in the non- α -conjugate ^{34}S nucleus [15]. The α -cluster structure in ^{34}S and ^{35}Cl has been studied by using shell-model calculations [10,15]. Therefore, this region gives us an opportunity to investigate experimentally the interplay between single-particle and collective-mode excitations and interpret them theoretically by using large-basis shell-model calculations.

^{38}K is an odd-odd ($N = Z = 19$) nucleus in the upper sd shell. In the recent past, we investigated the high-spin structure of a few upper sd shell nuclei, viz., ^{33}S [2], ^{34}Cl [3], ^{35}Cl [10], and ^{37}Ar [7]. The low-lying states of these nuclei are primarily generated from single-particle excitations. However, at higher excitation energy, the signature of collective excitation has been found. In ^{35}Cl , a superdeformed band has been observed above 8 MeV excitation energy. A candidate superdeformed band has been identified in ^{33}S [2] above 3 MeV excitation energy. In ^{34}Cl and ^{37}Ar , large configuration mixing in terms of different particle partitions in their calculated wave functions obtained from shell-model calculations clearly indicate the presence of collective excitations at higher excitation energy. It has also been noted that two normal deformed bands generated from 4p-4h excitation have also been reported in ^{38}Ar [16]. ^{38}Ar is the isobaric partner nucleus of ^{38}K . So, one may also expect collective excitations at higher excitation energy in ^{38}K , generated from multiparticle multihole excitations.

* abhijitbisoi@physics.iests.ac.in





REVIEW ARTICLE

Ion-exchange Resins and Polypeptide Supported Catalysts: A Critical Review

Kinkar Biswas¹, Sujit Ghosh² and Basudeb Basu^{1,3,*}

¹Department of Chemistry, Raiganj University, University Road, Raiganj 733134, India; ²Department of Chemistry, Raiganj Surendranath Mahavidyalaya, Raiganj 733134, India; ³Department of Chemistry, North Bengal University, Darjeeling 734013, India

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Abstract: Heterogeneous catalysis represents one of the important areas in the field of organic synthesis. Major developments have been emerged during last few decades and polymer-supported catalysts have been employed successfully in various catalytic organic transformations. Ion-exchange resins and polypeptides are two important examples of such heterogeneous polymer-supported catalysts among others because of their easy accessibility, stability, recoverability and reusability. Cross-linked ion-exchange resins and polypeptides are highly insoluble, which make them better choice in terms of their easy separation from the reaction mixture and subsequent recyclability. The present review article provides an overview of different types of ion exchange resins as polymer-supported catalysts such as amberlite resin, polystyrene resin, polyionic gel-based systems, ion-exchange resins and proline-immobilized species, PEG-bound poly (amino acid), amino acid anchored with Merrifield resin, amphiphilic block polypeptides *etc.* Their preparation, characterizations and catalytic applications in diverse organic transformations have been presented with critical analysis on their stability, mechanistic overview and suitability *etc.*

Keywords: Ion-exchange resins, polypeptides, polymer supports, nanoparticles, cross-coupling reactions.

1. INTRODUCTION

The Green chemistry promotes environmentally benign protocols comprising of energy consumption, atom efficiency and sustainability of chemical processes [1, 2]. Over the last three decades, scientists have concentrated on the exploration of new methods to replace toxic and harmful solvents by more environmentally benign alternatives [3-15]. Additionally, the design of more environmentally important and low impact protocols, including the use of magnetically separable nanomaterials [16-18], solvent-free reactions [19, 20], ultrasound-assisted reactions [21] and microwave-assisted organic synthesis (MAOS) [22-24] are also considered as greener protocols. Again, catalysis is considered as a foundational stone of green chemistry. Conventionally, the homogeneous catalysts are frequently applied in classical organic reactions to achieve target molecules. Suitably designed heterogeneous catalysts offer several advantages over homogeneous counterparts including easy separation and recyclability. Several polymeric materials and composites have been applied as heterogeneous catalysts.

Organic synthesis is mainly assisted by catalysis and further on by catalyst recovery and recycle [25, 26]. Catalyst recovery and reuse is the most emerging part in chemical

transformations. Catalytic technologies leading to the synthesis of chemicals are still largely dominated by homogeneous catalysts, whose separation from the reaction products and reuse is a major concern [27-29]. Due to the easier workup and integration in reactor equipment, the chemical industry has a strong preference for solid catalysts [30-32]. In order to recover and recycle the homogeneous catalysts, various techniques were developed over the last two decades involving the immobilization of a catalyst precursor onto an insoluble support material, so that the catalyst can be quantitatively separated by filtration and recycled. Preformed molecular homogeneous chemical catalysts (usually metal complexes or organometallic compounds) are most conveniently anchored to diverse materials through non-covalent binding. This is referred to as the heterogenization of homogeneous catalysts [33, 34]. The use of ion-exchange resins as Bronsted and/or Lewis solid acid catalysts can be recovered by simple extraction procedures [35-38]. The present article focuses primarily on diverse applications of ion-exchange resins and polypeptide supported catalysts in various organic reactions.

A variety of solids, often like inorganic and organic surfaces and their hybrid materials, draw immense attention to the field of catalysis. In this short review, we mainly emphasize organic polymeric solids and biocompatible renewable polymeric surfaces (ion exchange resin and polypeptides) involved in many organic reactions and various techniques of catalyst recovery include precipitation, filtration, decantation, centrifugation and magnetic separation have been carefully discussed.

*Address correspondence to this author at the Department of Chemistry, Raiganj University, University Road, Raiganj 733134, India; and Department of Chemistry, North Bengal University, Darjeeling 734013, India;
Fax: +91-3523-242580;
E-mails: basu_nbu@hotmail.com; basudeb.basu@gmail.com





REVIEW ARTICLE

Recent Advances in Microwave Promoted C-P Cross-coupling Reactions

Sujit Ghosh¹, Kinkar Biswas² and Basudeb Basu^{2*}

¹Department of Chemistry, Raiganj Surendranath Mahavidyalaya, Raiganj 733134, India; ²Department of Chemistry, Raiganj University, Raiganj 733134, India

Abstract: Organophosphorous compounds are of potential importance in diverse fields. They are often used as intermediates for making functionalized phosphine ligands as well as find vast applications in the areas of industrial, agricultural and biological chemistry. The microwave-assisted synthesis of C-P bonds has become increasingly popular because of its various advantages over conventional heating in the perspectives of green chemistry.

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This review article has primarily focused on the synthesis of various organophosphorous molecules via microwave promoted C-P cross-coupling reactions under metal-catalyzed or metal-free conditions over the last two decades. The synthesis of phosphine ligands on 4,4'-bisquinolone structural framework, disubstituted phosphinic acid esters, vinyl phosphines, aryl- and vinylphosphonates, sugar and nucleoside phosphonates, aminobisphosphonates, triphenyl phosphines, water-soluble tertiary phosphine oxides and many other potentially useful organophosphorous compounds have been illustrated critically. The Hirao reaction, Michaelis-Arbuzov reaction and Sandmeyer type of reactions are generally involved in creating C-P bonds. The role of various metal catalysts, solvents, bases, additives and temperature in different literatures are carefully discussed.

Keyword: Organophosphorous, C-P bonds, cross-coupling, hirao reaction, michaelis-arbuzov, sandmeyer

1. INTRODUCTION

Organophosphorus compounds (containing at least one carbon-phosphorus bond) are considered important for the field of organic synthesis, material sciences, agricultural field, industrial field, transition metal-catalyzed reactions, Metal-Organic Frameworks (MOFs) preparation and synthesis of biologically active molecules [1-9]. As a result, research on this field has attracted immense attention in the recent years. Over the last two decades, various synthetic methodologies for the preparation of organophosphorous compounds have been reported [10, 11]. Access to various organophosphorous molecules by a traditional addition reaction, Michaelis-Arbuzov reaction, has received particular attention [12-17]. Microwave is one of the electromagnetic radiations where the region (0.3 GHz-300 GHz) lies between radiowave (Rf) and Infrared (IR) frequencies with relatively large wavelengths (1 mm-1 m). This unconventional Microwave (MW) energy source has been used for heating food materials for almost the last five decades [18] and also being utilized for a variety of chemical applications including organic synthesis and material science over the last three decades [19-30]. Microwave heating during reactions has some advantages over conventional heating not only in terms of reaction rate acceleration or milder reaction condition but also for higher chemical yields involving lower usage of energy and different reaction selectivities. The two types of microwave effects are specific microwave effect and non-

thermal microwave effect. Specifically, in the microwave technique, the heating effect cannot be easily emulated through the conventional heating methods. On the other hand, unusual observations in microwave chemistry can be explained by non-thermal microwave effects which do not involve the transfer of microwave energy into thermal energy [31].

The present article has primarily focused on the role of microwave irradiation technique used in various C-P bond forming reactions [32, 33] with possible mechanistic discussion, other critical aspects and the advantages over conventional heating techniques. The discussion has been categorized on the type of synthetic routes of organophosphorous compounds.

2. SYNTHESIS OF VARIOUS C-P BOND FORMING COMPOUNDS

2.1 Synthesis of Vinyl Phosphine

The conversion of vinyl triflates to vinylphosphines [34] can be functionalized through secondary phosphine functionalization (Scheme 1). The preparation of polymeric phosphine ligands can be achieved through this process. The vinylphosphines synthesized by this protocol are fairly pure. The characterization of vinyl aryl phosphines was quite difficult. These phosphines were finally characterized through the conversion to the more stable borane complex. The dou-



RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
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Nuclear Data Sheets for A=218

Balraj Singh,^{1*} M.S. Basunia,² Murray Martin,³ E.A. McCutchan,⁴ Indu Bala,⁵ R. Caballero-Folch,⁶ Rhiann Canavan,⁷ Ritwika Chakrabarti,⁸ A. Chekhovska,⁹ M.M. Grinder,¹⁰ Samra Kaim,¹¹ Debasmita Kanjilal,¹² D. Kasperovych,¹³ M.J. Kobra,¹⁴ H. Koura,¹⁵ Soumen Nandi,¹⁶ Adina Olacel,¹⁷ Abhilasha Singh,¹⁸ and B.P.E. Tee¹⁹.

¹McMaster University, Hamilton, ON, Canada.

²Lawrence Berkeley National Laboratory, Berkeley, CA, USA.

³Oak Ridge National Laboratory, Oak Ridge, TN, USA.

⁴National Nuclear Data Center, Brookhaven National Laboratory, Upton, NY, USA.

⁵Inter-University Accelerator Centre, New-Delhi, India.

⁶TRIUMF, Vancouver, BC, Canada.

⁷University of Surrey, Guildford, UK; and N.P.L. Teddington, UK

⁸University of Mumbai, Mumbai, India.

⁹Kharkov Institute of Physics and Technology, Kharkiv, Ukraine.

¹⁰NSCL, Michigan State University, East Lansing, MI, USA.

¹¹Universite Freres Mentouri Constantine 1, Constantine, Algeria.

¹²Raiganj Surendranath Mahavidyalaya, Raiganj, India.

¹³Institute for Nuclear Research, National Academy of Sciences, Kiev, Ukraine

¹⁴Department of Physics, Rajshahi University, Rajshahi, Bangladesh.

¹⁵Japan Atomic Energy Agency, Tokai, Ibaraki, Japan.

¹⁶Variable Energy Cyclotron Centre, Kolkata, India.

¹⁷Horia Hulubei National Institute of Physics and Nuclear Engineering, Bucharest, Romania.

¹⁸CEA, LIST, Laboratoire National Henri Becquerel (LNE-LNHB), CEA-Saclay 91191 Gif/Yvette cedex, France.

¹⁹Australian National University, Canberra, ACT, Australia.

*Corresponding author, balraj@mcmaster.ca

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Abstract: The evaluated data are presented for 11 known A=218 nuclides (Pb, Bi, Po, At, Rn, Fr, Ra, Ac, Th, Pa and U). For ²¹⁸Pb, ²¹⁸Bi, ²¹⁸At and ²¹⁸Pa, data are available only for the ground states. For ²¹⁸U, only the g.s. and a high-spin isomer are known, with no data on γ -ray transitions available. For ²¹⁸Po, ten excited states are known from ²¹⁸Bi decay, with no knowledge on the multipolarities of gamma-ray transitions. For ²¹⁸Th, five excited states in the g.s. band are known from an in-beam γ -ray study. Data on level half-lives, multipolarities and mixing ratios of gamma transitions is generally lacking for A=218 nuclei. The static magnetic dipole moment has been measured for only an isomer in ²¹⁸Fr. With the exception of a new nuclide, ²¹⁸Pb, and measurements of half-lives of ground states of a few nuclides of A=218 and A=222, no substantial structure information has become available since the previous evaluation in 2006. Q values are adopted from 2017Wa10 (AME-2016). The present evaluation supersedes the previous A=218 ENSDF evaluations, 2006Ja03, 1995Ej08, 1987Ej12 and 1977To13. This evaluation was carried out as part of a joint IAEA-ICTP workshop for Nuclear Structure and Decay Data, organized and hosted by the IAEA, Vienna, and ICTP, Trieste, October 15-26, 2018.

Cutoff Date: All data received prior to October 30, 2019 have been considered. The main source of bibliographic search was the NSR database (2011Pr03) available at NNDC, BNL webpage: www.nndc.bnl.gov/nsr/.

General Policies and Organization of Material: See the January issue of the *Nuclear Data Sheets* or <http://www.nndc.bnl.gov/nds/NDSPolicies.pdf>.

General Comments: Theoretical conversion coefficients from BrIcc code (2008Ki07) have an implied uncertainty of 1.4%, when not stated. In the averaging procedure, the recommended uncertainty is generally not below the lowest experimental uncertainty in a set of data points.

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Task-Specific Properties and Prospects of Ionic Liquids in Cross-Coupling Reactions

Bablee Mandal¹ · Sujit Ghosh² · Basudeb Basu^{3,4}

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Abstract

Ionic liquids (ILs) are considered as highly useful materials for potential diverse uses such as greener and more convenient alternatives to volatile organic solvents, reagents, additives, ligands and co-solvents. Thermal stability, negligible vapor pressure and high polarity with ionic environments have possibly conferred some unique physico-chemical properties and a wider electrochemical window on ILs. More importantly, these properties are tuneable, depending on variations in alkyl chains and counter-anions. On the other hand, various transition-metal-catalyzed cross-coupling reactions constitute an important backbone of contemporary organic synthesis. A vast number of C–C and C-heteroatom cross-coupling reactions are reported in the presence of ILs, often showing better performance. The influence of IL on the action of a given catalyst or on the course of a reaction can be relatively complex, and is not understood well enough to be able to draw succinct conclusions. However, there are a few reports in the literature that help understand the role of actual and active catalytic species stabilized in an IL environment. Stabilization, which can be either helpful or detrimental to catalysis depends on specific circumstances. This review article is aimed primarily at summarizing the various applications of ILs during the past decade, focusing as far as possible on the task-specific properties of ILs in transition-metal-catalyzed C–C and C-heteroatom cross-coupling reactions. Several successful achievements and noteworthy progress in this field of research leads to the sensible conclusion that future prospects in this field of research are not only bright but promise new horizons.

✉ Basudeb Basu
basu_nbu@hotmail.com

¹ Department of Chemistry, Surya Sen College, Siliguri, Darjeeling 734004, India

² Department of Chemistry, Surendranath Mahavidyalaya, Raiganj 733134, India

³ Department of Chemistry, North Bengal University, Darjeeling 734013, India

⁴ Department of Chemistry, Raiganj University, Raiganj 733134, India





Research Article

Evaluation of different water exchange regimes for optimizing growth and production of koi carp, *Cyprinus carpio* in tanks

Prithwiraj JHA*

Department of Zoology, Raiganj Surendranath Mahavidyalaya, Raiganj 733 134, West Bengal, India.

*Email: jhakingshuk@gmail.com

Abstract: The effect of different water exchange regimes on the growth and survival of koi carp, *Cyprinus carpio* in tanks provided with the supply of exogenous zooplankton as the food was investigated. Fish larvae (0.15±0.012g) were stocked in outdoor concrete tanks at 0.5 fish/l (T1 and T2); 1.0 fish/l (T3 and T4); and 1.5 fish/l (T5 and T6) and cultured for three months. The water exchange rate was 10% once daily in T1, T3 and T5 and twice daily in T2, T4 and T6. Values of dissolved oxygen were highest in T2, followed by T4, T1, T6, T3 and T5. The T5 treatment showed the highest concentrations of conductivity, NH₄-N, NO₂-N, NO₃-N, PO₄-P, and bicarbonate alkalinity, which were significantly higher than the other treatments. The final body weight of *C. carpio* ranged from 4.01 to 8.22g in the different treatments. At harvest, maximum weight gain was achieved in the T2, followed by T4, T1, T6, T3 and T5 in descending order. There was a significant difference in the survival of koi carp among the treatments, ranging from 56.43% (T5) to 96.32% (T2). The percentage and number of fish exceeding a total weight of 5g were estimated from the size-frequency distribution at the end of the study and was significantly higher in T6 ($P<0.05$) than other treatments. From the present study, a daily water exchange of 20% could support higher stocking densities of koi carp in tanks and result in high productivity, measured in terms of the number of marketable fish.

Keywords: Aquaculture management, Ornamental carp, Fish production, Water quality.

Citation: JHA, P. 2019. Evaluation of different water exchange regimes for optimizing growth and production of koi carp, *Cyprinus carpio* in tanks. Iranian Journal of Ichthyology 6(4): 283-291.

Introduction

Animal manure has been traditionally employed by culturists in India and neighbouring countries to augment the production of plankton, a natural food item for fish (Chakrabarti & Jana 1998; Gupta & Noble 2001; Jha et al. 2004). However, using high amounts of animal manure can reduce the water quality (Boyd 1982; Singh et al. 1991) and thereby result in stress and impairment of normal metabolism in fish leading to fatigue, disease, and high mortality (Francis-Floyd 1990).

Ornamental fish, unlike food fish, are sold individually and have to be visually attractive to be accepted in the market, and stressed fish may be aesthetically unattractive to potential customers (Jha & Barat 2005a). Hence, particular pond management

techniques need to be developed to create the best environment for the fish.

Since most farmers in India cannot afford high-cost recirculating systems or aeration, manual water exchange in production tanks has been the only viable alternative to intensify production in ornamental fish culture units (Jha et al. 2004; Jha & Barat 2005a). On average, about 65.71% farmers in neighboring Bangladesh exchange water regularly in their ponds (Shofiquzzoha et al. 2017). An exchange of 5% of standing water volume from the tanks every day resulted in high production of koi carp, *Cyprinus carpio* Linnaeus, 1758 stocked at a density of 0.2 fish/L with a direct application of poultry manure (Jha & Barat 2005a) and 0.3 fish/L with application of a pellet diet (Jha & Barat 2005b).



Research Article

Evaluation of different water exchange regimes for optimizing growth and production of koi carp, *Cyprinus carpio* in tanks

Prithwiraj JHA*

Department of Zoology, Raiganj Surendranath Mahavidyalaya, Raiganj 733 134, West Bengal, India.

*Email: jhakingshuk@gmail.com

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EBI-3 Chain of IL-35 Along With TGF- β Synergistically Regulate Anti-leishmanial Immunity

Mohammad Asad[†], Abdus Sabur, Mohammad Shadab[†], Sonali Das, Mohd. Kamran, Nicky Didwania and Nahid Ali*

Infectious Diseases and Immunology Division, Council of Scientific and Industrial Research-Indian Institute of Chemical Biology (CSIR-IICB), Kolkata, India

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Werner Solbach,
Universität zu Lübeck, Germany
Catherine Margaret Miller,
James Cook University, Australia

*Correspondence:

Nahid Ali
nali@iicb.res.in

[†]Present address:

Mohammad Asad,
School of Medicine, Department of
Dermatology, University of Alabama at
Birmingham, Birmingham, AL,
United States

Mohammad Shadab,
Department of Pediatrics, University of
Rochester Medical Center School of
Medicine and Dentistry, Rochester,
NY, United States

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Immunosuppression is a characteristic feature of chronic leishmaniasis. The dynamicity and the functional cross talks of host immune responses during *Leishmania* infection are still not clearly understood. Here we explored the functional aspects of accumulation of immune suppressive cellular and cytokine milieu during the progression of murine visceral leishmaniasis. In addition to IL-10 and TGF- β , investigation on the responses of different subunit chains of IL-12 family revealed a progressive elevation of EBI-3 and p35 chains of IL-35 with *Leishmania donovani* infection in BALB/c mice. The expansion of CD25 and FoxP3 positive T cells is associated with loss of IFN- γ and TNF- α response in advanced disease. *Ex-vivo* and *in vivo* neutralization of TGF- β and EBI-3 suggests a synergism in suppression of host anti-leishmanial immunity. The down-regulation of EBI-3 and TGF- β is crucial for re-activation of JAK-STAT pathway for induction as well as restoration of protective immunity against *L. donovani* infection.

Keywords: regulatory T cells, *Leishmania*, immune response, interleukin-35, transforming growth factor beta, immune suppression

INTRODUCTION

Maintenance of immunological self-tolerance and homeostasis by restraining disproportionate and detrimental immune responses is primarily mediated by regulatory cytokine secreting lymphocytes (1). Conversely, expansion of regulatory cellular and cytokine milieu may lead to compromised immunity against certain infections such as *Brucella*, HIV, helminthes, and *Mycobacterium tuberculosis* including antitumor host immune responses (2–5). However, the correlation between effector and regulatory cell populations especially in terms of sensing and secretion of cytokines during diseased condition is still not well understood (6).

Visceral leishmaniasis (VL) is a potentially lethal disease caused by parasitisation of cellular components of innate immune system by *Leishmania donovani/Leishmania infantum* (7). A dysfunctional cell mediated immune response is one of the characteristic features of chronic VL (8, 9). Several studies have suggested the role of IL-10 and TGF- β in subversion of proinflammatory response in active VL (10, 11). Despite crucial evidences of the role of these cytokines in augmenting VL pathology, the mode of action of these immunosuppressive cytokines is not clearly understood (12). Apart from IL-10 and TGF- β , the role of other immunosuppressive cytokines in VL is yet to be established. IL-35 has been reported for its immunosuppressive activity in autoimmunity and infectious diseases (13–15). IL-35 is a heterodimeric cytokine with two polypeptides "α" and "β" chains. These polypeptides may participate in the construction of two or more cytokines for



RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Abhinandan Das

অভিযাত্রী ফেরী

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e-mail : biswas.achintya1955@gmail.com

What's app : 9830798843

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(Affiliated to University of Gour Banga, Malda)
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Dr. Supriya Pan

Cosmological time crystal: Cyclic universe with a small cosmological constant in a toy model approach

Praloy Das,^{1,*} Supriya Pan,^{2,†} Subir Ghosh,^{1,‡} and Probir Pal^{3,§}

¹Physics and Applied Mathematics Unit, Indian Statistical Institute,
203 Barrackpore Trunk Road, Kolkata 700108, India

²Department of Mathematics, Raiganj Surendranath Mahavidyalaya,
Sudarshanpur, Raiganj, Uttar Dinajpur, West Bengal 733134, India

³Department of Physics, Barasat Government College, 10, KNC Road,
Barasat, Kolkata 700124, India

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A new form time crystal has been proposed, and some of its consequences have been studied. The model is a generalization of the Friedmann-Robertson-Walker (FRW) cosmology endowed with noncommutative geometry corrections. In the minisuperspace approach, the scale factor undergoes the time periodic behavior, or Sisyphus dynamics, which allows us to interpret this cosmological time crystal as a physically motivated toy model to simulate the cyclic universe. Analyzing our model purely from the time crystal perspective reveals many novelties such as a complex singularity structure (more complicated than the previously encountered swallowtail catastrophe) and a richer form of Sisyphus dynamics. In the context of cosmology, the system can serve as a toy model in which, apart from inducing a form of the cyclic universe feature, it is possible to generate an arbitrarily small positive effective cosmological constant. We stress that the model is purely geometrical without introduction of matter degrees of freedom (d.o.f.).

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I. INTRODUCTION

In this paper, we aim to apply the fascinating concept of classical time crystal (CTC), proposed by Shapere and Wilczek [1,2] (see [3] for a recent review), in an extended model of Friedmann-Robertson-Walker (FRW) cosmology. Specifically, the extension is induced by a noncommutative (NC) gravity contribution with an underlying quantum gravity perspective. It was derived by Fabi, Harmes, and Stern [4]. In a nutshell, two of our principal results are the following:

- (i) The scale factor borrows the Sisyphus-like periodic behavior that characterizes the CTC, but more importantly for our present interest, it can naturally serve as a physically motivated toy model for a

cyclic universe, conceived by Steinhardt and Turok [5].¹

- (ii) Once again, borrowing a CTC feature, the minimum energy state (or ground state) consists of a condensate, leading to an arbitrarily small positive cosmological constant Λ .

Furthermore, it needs to be stressed that our model is purely geometric in the sense that no matter d.o.f. are added from the outside. This should be contrasted with recent works in cosmological CTC [6], where a scalar field model with eternal oscillations in an expanding FRW spacetime was discussed (see also [7] for further developments on the model). From a TC perspective as well, there is some novelty as recent works [8] concerning the physical realization of TC are all in the quantum domain,² whereas our framework is purely classical. The only classical example studied so far is in [1,2] that is not very realistic.

*praloydasdurgapur@gmail.com
†span@research.jdvvu.ac.in
‡subirghosh20@gmail.com
§probir.kumarpal@gmail.com

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¹We note that the perspective of cyclic cosmology [5] and that in the present model is somewhat different although, in the former, quantum gravity effects are not considered to be significant, whereas in the latter, the cyclic cosmological features emerge due to the noncommutative contributions which in turn are generally thought to be induced by quantum gravity effects. We consider a closed universe.

²The quantum TC was proposed by Wilczek [9] with experimental models for quantum TC in [10].

Chandan J.
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





Observational constraints on oscillating dark-energy parametrizations

Supriya Pan,^{1,*} Emmanuel N. Saridakis,^{2,3,4,†} and Weiqiang Yang^{5,‡}

¹*Department of Mathematics, Raiganj Surendranath Mahavidyalaya,
Sudarshanpur, Raiganj, West Bengal 733134, India*

²*Chongqing University of Posts and Telecommunications, Chongqing, 400065, China*

³*Physics Division, National Technical University of Athens, 15780 Zografou Campus, Athens, Greece*

⁴*CASPER, Physics Department, Baylor University, Waco, Texas 76798-7310, USA*

⁵*Department of Physics, Liaoning Normal University, Dalian, 116029, People's Republic of China*



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We perform a detailed confrontation of various oscillating dark-energy parametrizations with the latest sets of observational data. In particular, we use data from the joint light curve analysis (JLA) sample from supernovae type Ia, baryon acoustic oscillations (BAO) distance measurements, cosmic microwave background (CMB) observations, redshift space distortion, weak gravitational lensing, Hubble parameter measurements from cosmic chronometers, and we impose constraints on four oscillating models. From the analyses, we find that the best-fit characters of almost all models are bent towards the phantom region; nevertheless, in all of them, the quintessential regime is also allowed within 1σ confidence level. Furthermore, the deviations from Λ CDM cosmology are not significant; however, for two of the models they could be visible at large scales, through the impact on the temperature anisotropy of the CMB spectra and on the matter power spectra. Finally, we perform the Bayesian analysis, which shows that the current observational data support the Λ CDM paradigm over this set of oscillating dark-energy parametrizations.

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I. INTRODUCTION

The Universe acceleration at late times is one of the most interesting findings of modern cosmology, and thus there are two main directions that one could follow to explain it. The first way is to keep general relativity as the gravitational theory and introduce new components, that go beyond the standard model of particle physics, collectively known as the dark energy sector [1,2]. The second way is to construct a modified gravitational theory, whose additional degrees of freedom can drive the Universe acceleration [3–5].

At the phenomenological level, both the above approaches lead to a specific Universe accelerated expansion, that can be quantified by the evolution of the (effective in the case of modified gravity) dark energy equation-of-state parameter. Hence, parametrizations of the dark energy fluid can lead to reconstructions of the Universe late-time expansion. The basic idea relies on the fact that the dark energy equation-of-state parameter $w_x = p_x/\rho_x$, with ρ_x and p_x the dark energy density and pressure, respectively, can be parametrized using different functional forms in terms of the cosmological redshift.

In principle, there is not a theoretical guiding rule to select the best $w_x(z)$; however using observational data, it is possible to find viable parametrizations. In the literature, one can find many parametric dark energy models, that have been introduced and fitted with observational data: (i) one-parameter family of dark energy models [6] (ii) two-parameters family of dark energy parametrizations, namely, Chevallier-Polarski-Linder parametrization [7,8], linear parametrization [9–11], logarithmic parametrization [12], Jassal-Bagla-Padmanabhan parametrization [13], Barboza-Alcaniz parametrization [14], etc., (see [15–25]), (iii) three-parameters family of dark energy parametrizations [26], and (iv) four-parameters family of dark energy parametrizations [26–28].

One of the interesting parametrizations is the class of models in which $w_x(z)$ exhibits oscillating behavior [25,29–39]. The oscillating dark energy models are appealing and prove to lead to desirable cosmological behavior. In particular, they can alleviate the coincidence problem, since they may lead to both accelerating and decelerating phases in a periodic manner [30], and thus to dark matter and dark energy density parameters of the same order. Furthermore, one can construct oscillating dark energy models that can unify the current acceleration with the early-time inflationary phase [31].

The main question that arises naturally is whether oscillating dark-energy models are in agreement with the

*span@iiserkol.ac.in

†Emmanuel_Saridakis@baylor.edu

‡d11102004@163.com





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Supriya Pan

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Tale of stable interacting dark energy, observational signatures, and the H_0 tension

Weiqiang Yang,^a Supriya Pan,^b Eleonora Di Valentino,^c
Rafael C. Nunes,^d Sunny Vagnozzi^{e,f} and David F. Mota^g

^aDepartment of Physics, Liaoning Normal University,
Dalian, 116029, P.R. China

^bDepartment of Mathematics, Raiganj Surendranath Mahavidyalaya, Sudarshanpur,
Raiganj, Uttar Dinajpur, West Bengal 733134, India

^cJodrell Bank Center for Astrophysics, School of Physics and Astronomy,
University of Manchester,
Oxford Road, Manchester, M13 9PL, U.K.

^dDepartamento de Física, Universidade Federal de Juiz de Fora,
36036-330, Juiz de Fora, MG, Brazil

^eThe Oskar Klein Centre for Cosmoparticle Physics, Stockholm University,
Roslagstullbacken 21A SE-106 91 Stockholm, Sweden

^fThe Nordic Institute for Theoretical Physics (NORDITA),
Roslagstullbacken 23, SE-106 91 Stockholm, Sweden

^gInstitute of Theoretical Astrophysics, University of Oslo,
P.O. Box 1029 Blindern, N-0315 Oslo, Norway

E-mail: d11102004@163.com, span@research.jdvu.ac.in,
eleonora.divalentino@manchester.ac.uk, rafadcnunes@gmail.com,
sunny.vagnozzi@fysik.su.se, d.f.mota@astro.uio.no

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Abstract. We investigate the observational consequences of a novel class of stable interacting dark energy (IDE) models, featuring interactions between dark matter (DM) and dark energy (DE). In the first part of our work, we start by considering two IDE models which are known to present early-time linear perturbation instabilities. Applying a transformation depending on the dark energy equation of state (EoS) to the DM-DE coupling, we then obtain two novel stable IDE models. Subsequently, we derive robust and accurate constraints on the parameters of these models, assuming a constant EoS w_x for the DE fluid, in light of some of the most recent publicly available cosmological data. These include Cosmic Microwave Background (CMB) temperature and polarization anisotropy measurements from





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

A study on out-of-Pocket Healthcare Expenditure of the people of Siliguri Municipal Corporation Area (SMCA)*

Subrata Ghosh, Asst. Prof, Dept. of Economics, Raiganj Surendranath Mahavidyalaya P.O. Raiganj, Dist. Uttar Dinajpur, West Bengal, India,

*Part of doctoral work under the supervision of Dr. Amlan Majumder, Asst. Prof., Dinhati College and Dr. Sanchari Roy Mukherjee, Professor, University of North Bengal.

Abstract: It has long been proved that economic development remains a far cry without human development of the country and human development is only possible when everybody enjoys good health. Further, ensuring good health to everybody at affordable cost is one of the important goals of the government. But, in many developing countries including India, government finance in health sector is very less or limited which compels low income groups to seek healthcare facilities from private sources leading to a greater financial burden on them. Economists are also concerned with the impact of increasing costs of health imposed on patient, patient's family and other agencies. Against this backdrop, the present study will attempt to be familiar with impact of health status or diseases on out of pocket health expenditure of the people of Siliguri Municipal Corporation Area (SMCA). Also the problem calls for an in-depth analysis and it is very much relevant as the study on this issue has been very limited for the area concerned. The study will also suggest some feasible solutions to make the healthcare services accessible, affordable to all the people living in the region.

Key Words: Out-of-pocket health expenditure, Financial burden, SMCA

Introduction

Human resource development is intricately related to the process of economic development. Human development is an attempt to conceptually go beyond per capita income as an operational measure of economic development. Thus, economic development remains a far cry without human development of the country and human development is only possible when everybody enjoys good health (Ghosh, 2016). In other words, good health helps in creating the quality of human capital and thereby improves the human development as well as economic development of a nation. Recognizing importance of good health, World Bank (World Development Report, 1993) stated that "Improved health contributes to economic growth in four ways: it reduces production losses caused by worker illness; it permits the natural resources that had been totally or nearly inaccessible because of disease; it increases the enrollment of children in schools and makes them better able to learn; and it frees for alternative uses of resource that would otherwise have to be





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Dr. Subrata Ghosh

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Original Research Paper

Economics

HEALTH SEEKING BEHAVIOR OF NORTH BENGAL: A STUDY OF THE EFFECTS OF SOCIO-ECONOMIC AND DEMOGRAPHIC CHARACTERISTICS ON THE HEALTHCARE FACILITIES IN SILIGURI MUNICIPAL CORPORATION AREA (SMCA)*

Subrata Ghosh

Asst. Prof, Dept. of Economics, Raiganj Surendranath Mahavidyalaya P.O. Raiganj, Dist. Uttar Dinajpur, West Bengal, India,

ABSTRACT

BACKGROUND: With urbanization and modernization, majority of the developing countries including India is passing through demographic as well as epidemiologic transition with varying morbidity prevalence rates among different background people. Present study made an attempt to address the health seeking behavior in the light of socio-economic and demographic characteristics of the people of Siliguri Municipal Corporation Area (SMCA), since the region is characterised substantial population pressure, rapid urbanisation, persistent migration, increasing slums etc and diversified or unstructured healthcare facilities.

MATERIALS AND METHODS: Multi-stage sampling method was adopted and cross-sectional survey was conducted with 400 households or 1,684 persons on nature and extent of utilization of available healthcare facilities during their illness.

RESULTS: Healthcare facility utilisation rate was 378.86 per 1000 persons. Though there is no such remarkable variation exists among the different castes and religions regarding the use of healthcare service facilities but disparity is found in case of other factors such as gender, age, household monthly income, marital status etc.

CONCLUSION: Despite the availability of healthcare facilities, all illness episodes were not utilised the healthcare services, variation in socio-economic and demographic background of the people could be the probable reason. To some extent, health seeking behaviour of the individual is influenced by several other factors such as pattern of utilisation, source of care and system of medicine utilised during the reference period.

KEYWORDS : Burden of Disease, Utilisation, Healthcare Services, SMCA

INTRODUCTION

Health is an essential ingredient of human welfare (Mushkin, 1962). However, health is defined as "state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity" (WHO, 1946). It means healthy person should not suffer from any kind of disease or impairment and he or she can establish balance between and within himself or herself with the social and physical environment. So, health services should be distributed for the interest of the patients and communities regardless of costs (Lee and Mills, 1983). The distribution should be based on 'need', not on individual demand (Fuchs, 1966) or 'economic status' (Lindsay, 1969; Prinja et al., 2012). People also desire an improvement in health status, greater access to health related services (Lee and Mills, 1983). But, literature finds that India is passing through the phase of demographic as well as epidemiological transition with decrease in communicable related diseases and increase in non-communicable diseases (Reddy et al., 2005; Ghosh and Arikiasamy, 2010; Varatharajan, 2011; Bloom et al., 2013) and North Bengal is no exception to this earlier. This burden of diseases truly affects the utilisation of healthcare facilities (public, private or else). The utilisation of healthcare services has multifaceted and multi-dimensional features. It primarily depends on demographic and socio-economic condition of the sick person. Sometimes, cultural background of the sick person play significant role in utilising any particular type of healthcare facility. However, the health seeking behaviour of a community reflects how healthcare services are utilised by them. Empirical studies conducted so far on the utilisation of healthcare services at the individual level or at the community level in developed and developing countries including India are concerned with the identification of the variables which directly or indirectly affect the health seeking behaviour in a variety of social settings, but health seeking behaviour of the people of a corporation city, where there is no any structural guideline for healthcare institution as exits in the rural areas of the country under the aegis of National Rural Health Mission (NRHM) are less researched or needs to be explored further. Against this backdrop, the present study makes an attempt to examine how healthcare services are utilised by the people of Siliguri Municipal Corporation Area (SMCA) of West Bengal state, which is characterized by persistent migration, rapid urbanization, increasing slum etc.,

Historical Background of the Health Seeking Behaviour Theory

Healthcare is considered as one the facet of social study because various social factors directly or indirectly influence the sick person

in his different stages of sickness and treatment process. However, disease and illness are not synonymously used in the sociological literature. While on the one hand, disease is the unwanted biological process or condition disturbing the individual, on the other hand, illness is considered as the experience and the social or psychological impacts of the disease on individual (Cockerham, W.C., 2009). This 'state of illness or disability in a population', can also be termed as morbidity, where people are in between 'ideal health condition' and 'death' (Majumder, 2006). However, the commencement or the continuation of the treatment by and large depends on 'perceived seriousness of the disease' by the sick person, not on the clinically diagnosed impairments, as viewed in Health Belief Model by Rosenstock (1974). Further, Murray and Chen (1992) argued that self-perceived morbidity is influenced by cultural background and socio-economic dynamics of the patients. Further, Health belief model (Rosenstock, Strecher, & Becker, 1994) emphasises on the individual health seeking behaviour towards the available healthcare facilities when he or she perceives himself or herself as sick considering four variables: 1) perceived susceptibility to disease; 2) perception of illness severity; 3) perception of benefits versus costs; 4) promptness to action.

Besides all these theories and models, two other major frameworks such as Andersen & Newman model (1973) and the Kroeger's model (1983) have attempted to explain the healthcare services utilisation of an individual from the behavioral aspect. On the one side, Anderson and Newman (1973) argue that utilisation of healthcare services is a function of three factors viz. 1) predisposing factors comprising of socio-cultural characteristics such as social structure, health beliefs and demographic profile; 2) enabling factors represent family attributes and community resources such as personal or family income, health insurance, a regular source of care, travel, extent and quality of social relationships, and 3) need factors comprising of illness characteristics, perceived health status, and expected benefit from treatments.

According to Anderson and Newman (1973), two types of need are found in healthcare. One is perceived need and other one is evaluated need. Perceived need is felt by the individual in the form of want, but when perceived need is turned into demand, it becomes evaluated need, that is, utilisation of healthcare services. It is expected that an individual first perceive or recognise the disease as serious considering the presence of other factors such as predisposing and enabling factors and then takes decision whether

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
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Bengali Women's Writings in the Colonial Period: Critique of Nation, Narration, and Patriarchy



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Bengali Women's Writings in the Colonial Period: Critique of Nation, Narration, and Patriarchy

Sanchayita Paul Chakraborty  and Dhritiman Chakraborty 

From the journal [Zeitschrift für Anglistik und Amerikanistik](#)
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Citations 1

Abstract

Critical engagements like the first autobiography written by a Bengali woman, Rasasundari Devi, and the non-fictions by Kailashbasini Devi, Krishnabhabini Das, and other women writers in the second half of the nineteenth century contested the imagined idealization of the Hindu domesticity and conjugality as spaces of loveableness and spiritual commitment. They criticized coercion in child-marriages and the forceful injunctions of the Hindu scriptures on both married and widowed women. Such rhetoric of quasi empowerment needs to be disaggregated to perpetuate issues of 'double colonization,' 'dual-hold' in feminism in India. The question is whether there can be any grounds of women's agency in the Indian tradition. Eurocentric critiques are ill-equipped to politicize all modalities of a culture of social exclusion in Hindu imaginaries. Henceforth, as questions of equality, emancipation, and empowerment are fiercely debated in the public domain in contemporary India, we need to argue how immanent dissenting woman subjectivity can originate to counteract multiple patriarchies formed in Indian immediacies.

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Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

Sudarshanpur, Raiganj, Uttar Dinajpur
(Affiliated to University of Gour Banga, Malda)
Recognized by UGC U/S 2f & 12(B)
NAAC accredited College with "B+" Grade (December, 2016)

Arindam Debnath

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Original Research Paper

Political Science

MAOISM AND ITS RELAVANCE:-CHALLENGES TO GLOBALIZED INDIA

Arindam Debnath

Assistant Professor.institution-raiganj Surendranath Mahavidyalaya.

KEYWORDS :

Indian state is becoming an economic powerhouse, but Maoist movement threatening continuously. Delhi's so praised economic globalization and its importance on the mini malist state interference have much to do with the Maoist further gathering of strength. Today these leftist extremists are stretching their activity area from the Nepalese border to northern parts of Kerala (an Indian province). The Indian ministry of home affairs declared states and districts are highly affected (Sahani/Singh 2010); seven of them are quite dangerous. Some pocket and interior jungles where down-trodden poverty exploited people and untouched from Indian mainstream civilization are attracted to Maoist politics. They mobilize them against state. This problem can be marked the most critical threat to India's security, its origin getting worse; though India is attacked by many conflicts-but in terms of death, atrocities, span of affected and conflicted area it should be taken as a probably greatest muscle power against India. Kashmir and north east are located in its west and east. Whether China and Cuba slowly turning their face from communist ideology in India Maoist are still a great threat.

20 states and 223 districts are regarded as red corridor by mass media and security department. It comprises least developed and poorest region of India. Maoist movement accumulated high amount of tribal and untouchables (Dalits). Former finance minister P. Chidambaram shows us wealthier states are getting more developed where poorer states situation getting worse, and these developing dichotomy creating Maoist alliance with poor people. Private industry and businessman choosing Gujarat, Maharashtra, Haryana, New Delhi where infrastructure and market situation is slightly better, for this reason their annual growth average 8-10% in the other hand Bihar, Orissa, Andhra Pradesh, Madhya Pradesh basically agrarian and whose expenditure depends basically on federal funds whose economic structure is primarily agrarian. This disparity is effect of rapid liberalization and privatization in the past few decades and much low spending in governmental development project. Weak industrialization and wide spread unemployment in rural and interior places force some citizen from poorer states to wealthier states and urban centres, others situation getting declined and some of them have taken up arms on their hand to counter Indian dichotomy of economic liberalization. In response states main approach towards this threat focused mainly on the re-establishment of law and order.

During 2009 situation become fierce Indian government started comprehensive offensive action called 'GREEN HUNT'. Deploying around 70000 paramilitary troops against the Maoist terrorist. This year nearly 800 people have been killed in the conflicted area. Surprisingly this operation. Surprisingly this operation attracted a small range of media and foreign attention. Although it is one of the biggest internal armed conflict in the world. This turmoil exists since more than 50 years. In recent years this subject is studying in Indian context to find out the reason behind this upheaval and its roots. Not only social scientist and journalist also a great number of former security personnel have contributed to the study of Maoism.

In recent years they demanding forest rights, land redistribution, minimum wages. Interior villages which are far from access served as a safe havens for Naxalites. Adivasis used forests from many decades but forest conservation rights impose restriction and Maoist get their sympathy. Corruption within forest officials pushed

them to armed Maoist. Following the politics of liberating the rural areas the Maoist not only able to get their demands but also establish some kind of parallel government, they also redistributed land, imposed taxes and established courts (the courts resolves not only economic but also the legal matters).

Observer research foundation in Delhi, estimates the Naxalites now have 9000-10000 armed fighters, with access to about 6500 fire arms. There are about a further 40000 full time cadres. This working statistics shows Naxalite power in India broadening their area. In most places they have an underground, hit and run force. But in Baster forest area they are well armed and controlled the region. Controlling the large piece of land and operating actions across states borders of Andhra Pradesh and Orissa. In the tiny village scattered across the jungle the Indian state administration is quite invisible (THE ECONOMIST 2006). Moreover they introduced a social code forbidding alcohol consumption nearly half million acres in Andhra Pradesh, banned gambling and prostitution in rural population, state is completely absent, disregarded or corrupt in those region. In reality Maoist are preventing administration developmental interference. In one side there is a hand-pump installed by the local government but the well has become dry due to less maintainance, Maoists were preventing government to enter that area. There are no roads, electrification, telephone connection. In villages teachers do not come and where teacher is present there is no school building-classes holds outdoors. Policemen, health workers, and officials are never seen in those area, they are frighten to cross the Maoist region. The emptiness of administration was filled up by Naxalite committees, running village affairs and providing logistic support to the terrorists camping in the forest. For the past few years these terrorists, mostly local tribal people -have been fighting not just the police and army but their own neighbours who are peace loving and eager to join mainstream India. Indian state and administration formed and backed SALWA-JUDUM (Peoples front who supports Indian agenda) an anti Maoist group. This group so became an arm of government policy and paramilitary force. Some 5000 of its members have been inducted as special police officers and given training and arms. This anti Maoist 'SCORCHED VILLAGE' policy is tried to starve Maoist of local support. This recognize that the Naxalite's real strength lies not in their guerilla in the jungle but in their civilian networks in the villages themselves. According to local governments thousands of people started turning up by the roadside, fleeing Naxalite camps. There was a no choice but resettled them in relief camps; of which there are now 17 (THE ECONOMIST 2006). Naxalites threatened many poor people for having a government contract or brick house. The Maoist ruthlessness crossed every limit, they load the corpses of their victims with mines so those trying to serve the bodies are also killed. According to K.P.S. Gill a retired police personnel who known as a supercop said their ideology is that the manner of killing should frighten more than the killing itself. For local officials in Dantewada and the state government, the Maoists are just bandits, extortionist. Himanshu Kumar who run aid projects in district says he used to respect the Naxalites as working for the betterment of the masses but he now found people supporting them out of fear of their guns, or to gain power to loot others (THE ECONOMIST 2006). Most of their young recruits are illiterate tribal people have never knowledge of Maoism most of them are poor farmers seeking a small money from selling forest products like kendu pata. According to the 2001 census, about three quarters of Dantewadas 1220 villages are almost wholly tribal, 1161 have no

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D





RAIGANJ SURENDRANATH MAHAVIDYALAYA

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Disciplinary Planning and Business Opposition in Colonial India, 1942 – 1945: The Myth of Developmental Bourgeoisie

Abhinandan Das

Assistant Professor, Department of History, Raiganj Surendranath Mahavidyalaya, West Bengal

In the last phase of British colonial rule, the Bombay Plan occupied a significant and overhyped position and various studies on post-war economic history of India highlighted it as a parameter of the 'nationalistic-developmental' zeal of the indigenous capitalist class¹ who *fought against the British capital and government for the betterment of the nation (sic)*.² Rajat K. Ray considered the Bombay Plan as a sign of development and asserted that 'the [capitalist] class as a whole was seriously committed to planning.'³ 'India's post-independence socialist (*sic*) regime', according to Rajat K. Ray, 'had its roots in the economic concepts which had developed in the late thirties and early forties... The leading industrialists of India had come to subscribe to these conceptions during the second world war, and even before that.'⁴ Here some questions arise-in what situation did the representatives of Indian big bourgeoisie take certain positions on the question of state-led economic planning in colonial India and what was their class interest behind it. This paper attempts to understand the historical background of this problematic.

Changing Political Scenario and Formation of the Bombay Plan

Regarding these questions, two vital reasons came forward, according to Chibber, for the causes behind capitalist inclination into the planning process. First, with the initiative of the formation of the National Planning Committee (NPC) by the Congress it was quite clear that there would be some kind of economic planning in India after independence. By realising this, the representatives of Indian big capital also tried to influence the structure of planning in favour of their own interest, i.e., a capitalist planning. The Bombay Plan was the outcome of this initiative. Its main objective was to develop state-led capitalism in which the state would provide the basic infrastructure to facilitate the capitalist growth-process. The representatives of Indian big capital totally rejected the notion of disciplinary planning through which the state would 'regulate the actual flow of capital into the desired sectors' through various means.⁵ Second, the massive mass movement outside the Congress platform, of 1942-43 against colonial rule was an indicator of changing political equation, raised

Chandan J
Principal
Raiganj Surendranath Mahavidyalaya
Raiganj, U/D

