



Nanded Education Society's
Science College, Nanded

Tel: 02462-250 465, 251 648

www.sciencecollegenanded.org

(Affiliated to Swarni Ramnand Teerth Maratheoda University, Nanded)

(Reaccredited with 'A' grade by NAAC with (CGPA 3.38)

3rd Cycle, CPE Status, DST-RIS, Best College Award (SRTMUN)

SELF STUDY REPORT
FOR
IV CYCLE OF REACCREDITATION



Criterion- III

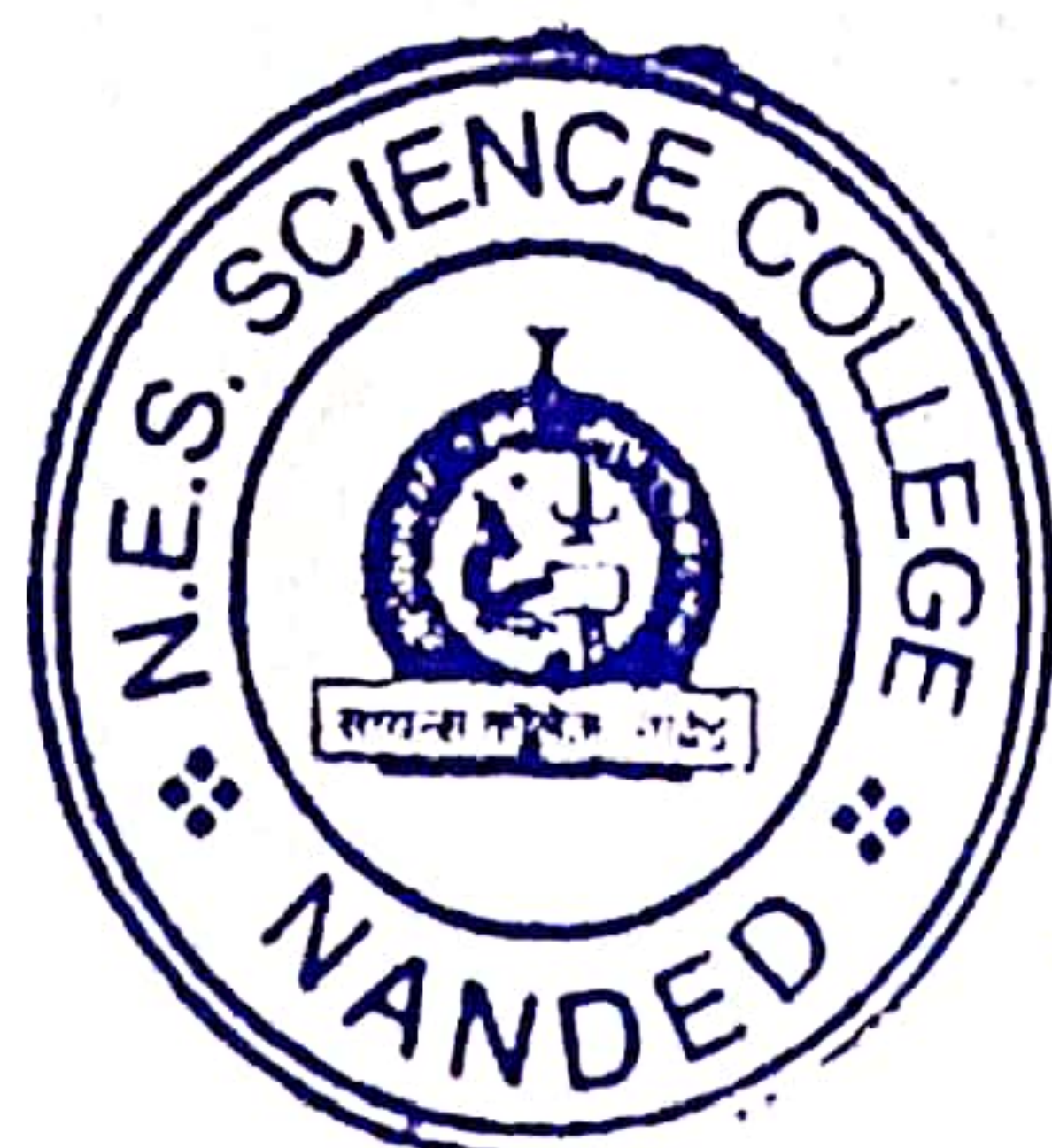
Research, Innovations and Extension
(Key Indicator 3.3- Research Publication and Awards)

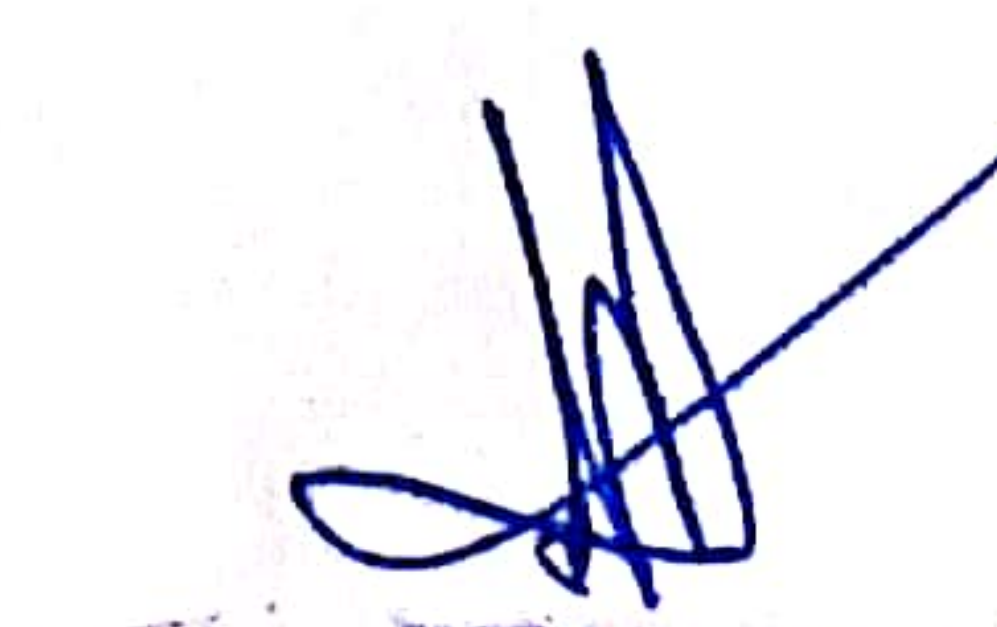
- 3.3.1. Number of research papers published per teacher in the Journals
QnM as notified on UGC CARE list during the last five years

Science College, Nanded

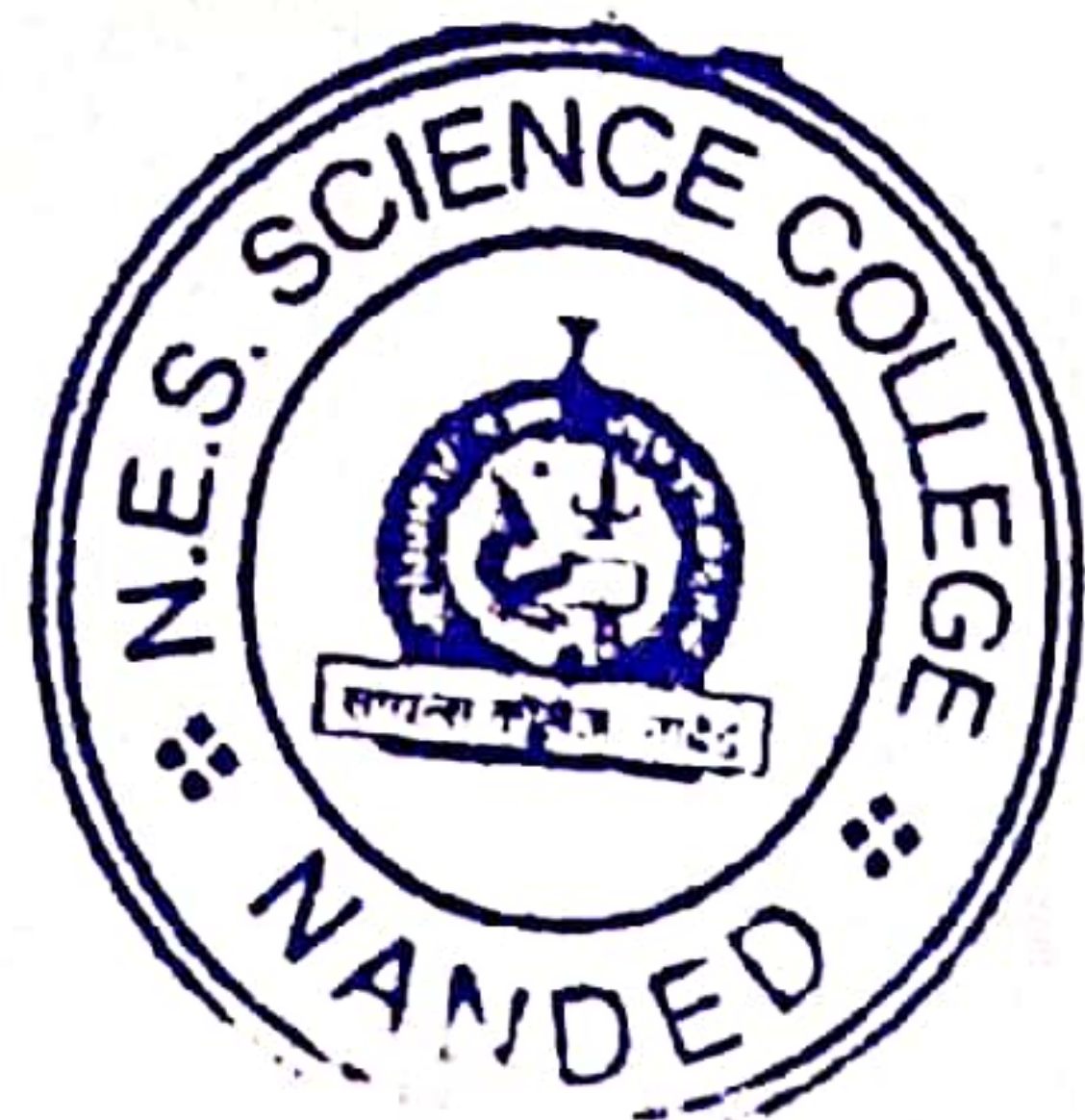
List of research papers published(2018-19 to 2023-24)

Sr. No.	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number
1	Antifungal activity of leaf extracts against fungal pathogens associated with Soybean Seeds	Dr. B. D. Gachande	Department of Botany, Micro biology & Biotechnology	Bioinfolet (1493):343	2018-19	Print ISSN : 0973-1431. Online ISSN : 0976-4755.
2	Effect of organic and inorganic agricultural inputs on soil nutrient and mycoflora of cotton field	Dr. B. D. Gachande	Department of Botany, Micro biology & Biotechnology	International j. of Botany studies 12(6):78-83	2018-19	ISSN:2455-541X
3	Argemone ochroleucasweet(Papaveraceae)a new distribution al, record from Palamu division of Jharkhand India	Dr. V B. Chavan	Department of Botany, Micro biology & Biotechnology	International journal of current research 2017 9(7):53779-53780	2018-19	ISSN(E): 0975-833x
4	Evaluation of Phytocompounds from petroleum ether extract of <i>Altrnantherasessilis</i> (L.) DC. by using GC-HRMS techniques.	Dr. V. R. Marathe	Department of Botany, Micro biology & Biotechnology	World Journal of Pharmaceutical Research. Vol. 7 (3): 842-848.	2018-19	ISSN: 2277 – 7105 (SJIF Impact factor: 7.523)
5	Influence of different yeast strains on physiochemical characteristics of Banana wine	Dr. P. D. Satav	Department of Botany, Micro biology & Biotechnology	Bioscience Discovery	2018-19	ISSN(E): 2231-024x
6	Antagonistic activity of endophytic fungi isolated from <i>AdhathodaVasica</i>	Dr. R. V. Sangvikar	Department of Botany, Micro biology & Biotechnology	Bioinfolet	2018-19	ISSN 0973-1431




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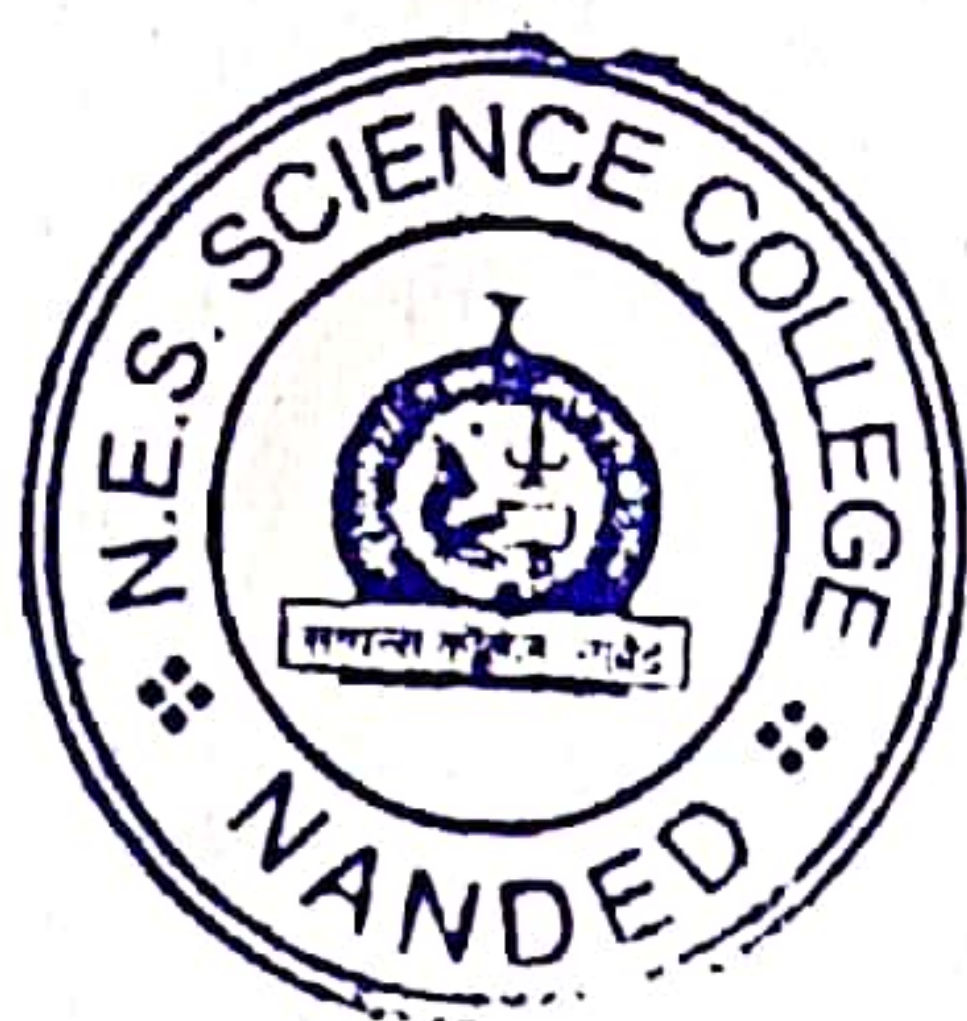
7	Strike slip shearing of Kinwat granitoid at South East Deccan Volcanic Province, Kinwat, Maharashtra, India	Dr. P. R. Wesanekar	Department of Geology	Journal of Earth System Science; DOI 10.1007/s12040-017-0853-8 E-W, PP 1-12; July 2017; Peer Review; Academy of Sciences	2018-19	ISSN: 0253-4126
8	Fuzzy transportation by using Fuzzy Random Number	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	International Review of Fuzzy Mathematics, Volume 12, No.1, June-2017, 82-94	2018-19	ISSN: 0973-4392
9	Admissibility and Asymptotic Behavior of Summation Equation	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	International Journal of Applied Mathematics and Applications, Volume 9 • No 2, July-Dec 2017, pp-139-144.	2018-19	ISSN: 0973-5844
10	Some Comparison Results in Difference Equations	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	Journal of Global Research in Mathematical Archives, Vol. 4. No. 10, Oct. 2017, pp: 58-63.	2018-19	ISSN: 2320-5822
11	Steady-State Heat Conduction Problem in a Thick Circular Plate and Its Thermal Stresses	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	International Journal of Pure and Applied Mathematics, Volume 115 No. 2 2017, pp.	2018-19	ISSN: 1314-3395




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				301-310		
12	Solution of Differential Equations by using differential Transform Method	Dr. P. S. Sutkar	Department of Mathematics	International Journal of Mathematical Sciences and Eng. Research, Vol. 11, Aug. 2017	2018-19	ISSN: 2347-3142
13	Solution of some differential equation by using differential Transform Method	Dr. P. S. Sutkar	Department of Mathematics	International journal of scientific and innovative mathematical research	2018-19	ISSN: 2347-307X
14	Systematic study on the impact of GST on sports	Dr. A. P. Borikar	Department of Sports	Ajanta	2018-19	ISSN:2277-5730
15	EFFECT OF TEMPERATURE AND pH ON PECTIN LYASE ACTIVITY PRODUCED BY PENICILLIUM DIGITATUM ON ORANGE PEELS	Dr. D. U. Gawai	Department of Botany, Microbiology & Biotechnology	European Journal of Biomedical and Pharmaceutical sciences Volume 4, Issue 4, 276-279.	2018-19	ISSN: 2349-8870
16	Effect of Temperature and pH on growth of <i>Alternaria alternata</i> , leaf spot pathogen of soyabean	Dr. D. U. Gawai	Department of Botany, Microbiology & Biotechnology	Bioscience Discovery, 9(1): 162-165,	2018-19	ISSN: 2229-3469




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17	Evaluation Of Some Biochemical Changes In Soyabean Crop Infected With Leaf Spot	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	Disease <i>European Journal of Biomedical an Pharmaceutical sciences</i>	2018-19	ISSN: 2349-8870
18	In Vitro Evaluation Of Some Plant Extracts Against <i>Alternaria alternata</i> Causing Leaf Spot Of Soyabean	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	European Journal of Biomedical and Pharmaceuti cal sciences Volume 5, Issue 2, 467-468.	2018-19	ISSN: 2349-8870
19	Effect of chlorothalonyl and mancozeb on growth of <i>Aureobasidium Pullulans</i> (De Bary) G. Arnaud	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	Bioinfolet - A Quarterly Journal of Life Sciences Vol ume : 15, Issue : 1	2018-19	ISSN: 0976-4755
20	Screening Of Cellulase Producing Fungi Isolated From Tomato Fruits	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	European Journal of Biomedical and Pharmaceuti cal Sciences Volume: 5 Issue: 6 , 626-631.	2018-19	
21	Evaluation of some biochemical changes in Soybean Crop infected with leaf spot disease	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	European Journals of Biomedical and Pharmaceuti cal science Volume: 5	2018-19	IMPACT FACTOR : 7.482 ISSN 2349-8870
22	In Vitro evaluation of some plant extracts against <i>Alternaria alternate</i> causing leaf spot of Soybean	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	European Journals of Biomedical and Pharmaceuti cal science Volume: 5	2018-19	IMPACT FACTOR : 7.482 ISSN 2349-8870




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23	Studies on Quantitative Analysis of Rhizosphere and Non-Rhizosphere Mycoflora at Different Stages of Plant Growth in Different Varieties of Pigeon Pea [<i>Cajanus cajan</i> (L.) Millsp.]	Dr. B. D. Gachande	Department of Botany, Microbiology & Biotechnology	International Journal of Pure and Applied Bioscience	2018-19	ISSN: 2320 – 7051
24	Purification and Immobilization of Thermostable serine Alkaline Protease from <i>Bacillus Subtilis</i> .	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	The PharmaInnovation, May 2018, Vol. 07, No. 5; pp. 622 - 626.	2018-19	ISSN(E): 2277-7695
25	Continuous production of Urocanic acid by immobilized <i>Pseudomonas aeruginosa</i> species.	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	IOSR Journal of Pharmacy, June 2018, Vol. 08, No. 06; pp. 072 - 078.	2018-19	ISSN (E): 2250-3013
26	Pharmacological and Nutritional Importance of Sea buckthorn (<i>Hippophae</i>),	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	The Pharma Innovation, May 2018, Vol. 07, No. 5; pp. 258-263.	2018-19	ISSN(E): 2277-7695
27	Synthesis, characterization and antibacterial activity of some N-alkyl benzimidazolpiperazinefluoroquinolones	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	Journal of Medical Science and clinical Research, May 2018, Vol. 06, No. 5; pp. 561 - 571.	2018-19	ISSN(E): 2347-176x




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28	Fermentation of banana juice using grape fruit juice inoculum. The Pharma Innovation. 2018 7 (2) : 32-34.	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	The Pharma Innovation. 2018 7 (2): 32-34.	2018-19	ISSN(E): 2277-7695
29	Effect of chlorothalonil and mancozeb on growth of Aureobasidium pullulans (De Bary) Arnaud.	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	Bioinfolet Vol.15 No.1	2018-19	ISSN 0973-1431;0976-4755
30	HPTLC profiling of two ethno medicinally important species of Calatropis	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	Int. J. of Life Sciences. 6 (1):265-270	2018-19	ISSN:2320-7817(p) 2320-964X(o)
31	Phytochemical investigation and antimicrobial activity of Asparagus racemosusWilld root against some pyogenic bacteria	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	The Pharma Innovation. 2018 7 (3): 115-118.	2018-19	ISSN(E): 2277-7695
32	Proximate and phytochemical evaluation of a non-conventional vegetable- <i>Bidens biternata</i> (Lour.) Merr& Sheriff.	Dr. V. R. Marathe	Department of Botany, Micro biology & Biotechnology	European Journal of Biomedical and Pharmaceuti cal sciences. Vol. 5 (2): 437-439.	2018-19	ISSN: 2349 – 8870
33	Study of future food crop <i>Bidens biternata</i> (lour.) Merr. And Sheriff. – A nutraceutical approach.	Dr. V. R. Marathe	Department of Botany, Micro biology & Biotechnology	International Journal of Recent Trends in Science and Technology. Special Issue ICRAFHN-2018, pp 37 – 39.	2018-19	2277-2812 (P);2249-8109 €



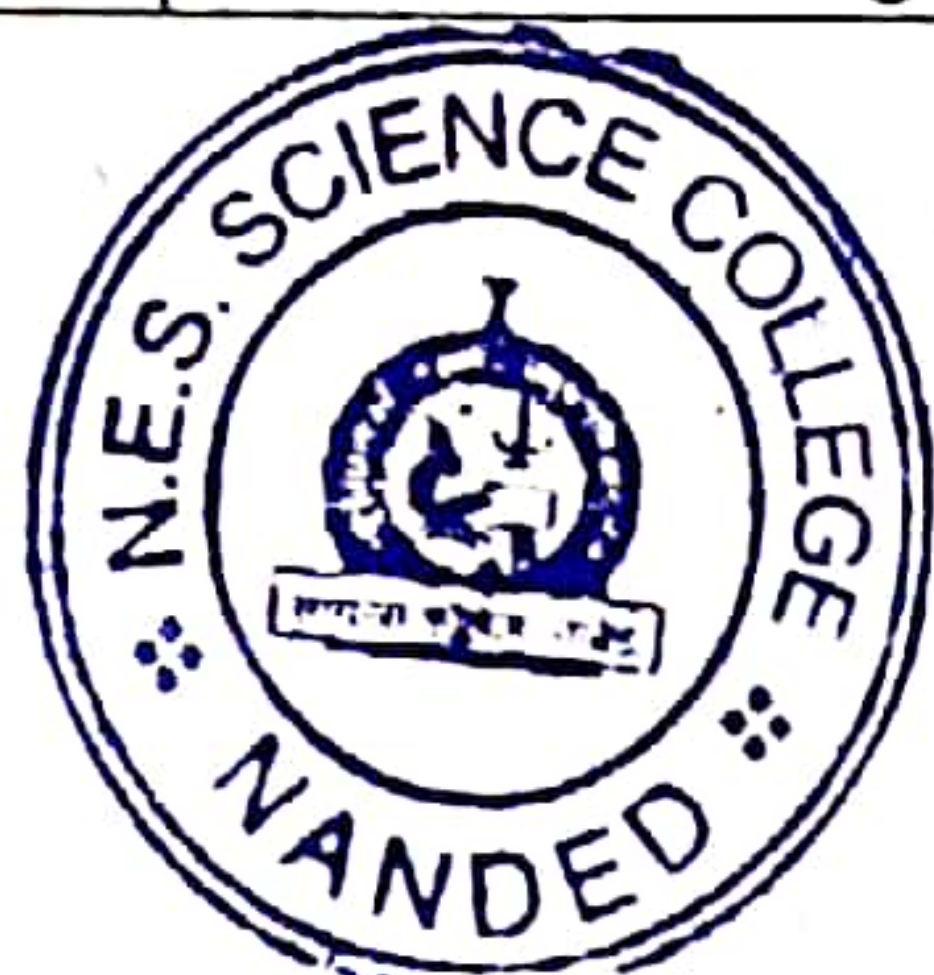

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34	Elemental analysis of Alternanthera sessilis (L.) DC. Leaf by ICP-AES Technique	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	The Pharma Innovation Journal 7 (9); 2018-220	2018-19	ISSN (E): 2277-7695 ISSN (P): 2349-8242
35	Nutraceutical evaluation of Acalypha indica L. - A potential wild edible plant.	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	International Journal of Green Pharmacy 12 (3) Pp S510-S517.	2018-19	P-ISSN - 0973-8258 E-ISSN - 1998-4103
36	Fermentation of banana juice using grape fruit juice inoculum. The Pharma Innovation. 2018 7 (2) : 32-34.	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	The Pharma Innovation. 2018 7 (2): 32-34.	2018-19	ISSN(E): 2277-7695
37	Effect of must dilution on fermentation of banana fruit pulp into white wine International Journal of Food Science and Nutrition	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	International Journal of Food Science and Nutrition	2018-19	ISSN: 2455-4898
38	Fermentation of banana juice using grape fruit juice inoculum. The Pharma Innovation. 2018 7 (2) : 32-34.	Dr. P. D. Satav	Department of Botany, Microbiology & Biotechnology	The Pharma Innovation. 2018 7 (2): 32-34.	2018-19	ISSN(E): 2277-7695
39	Effect of must dilution on fermentation of banana fruit pulp into white wine International Journal of Food Science and Nutrition	Dr. P. D. Satav	Department of Botany, Microbiology & Biotechnology	International Journal of Food Science and Nutrition	2018-19	ISSN: 2455-4898



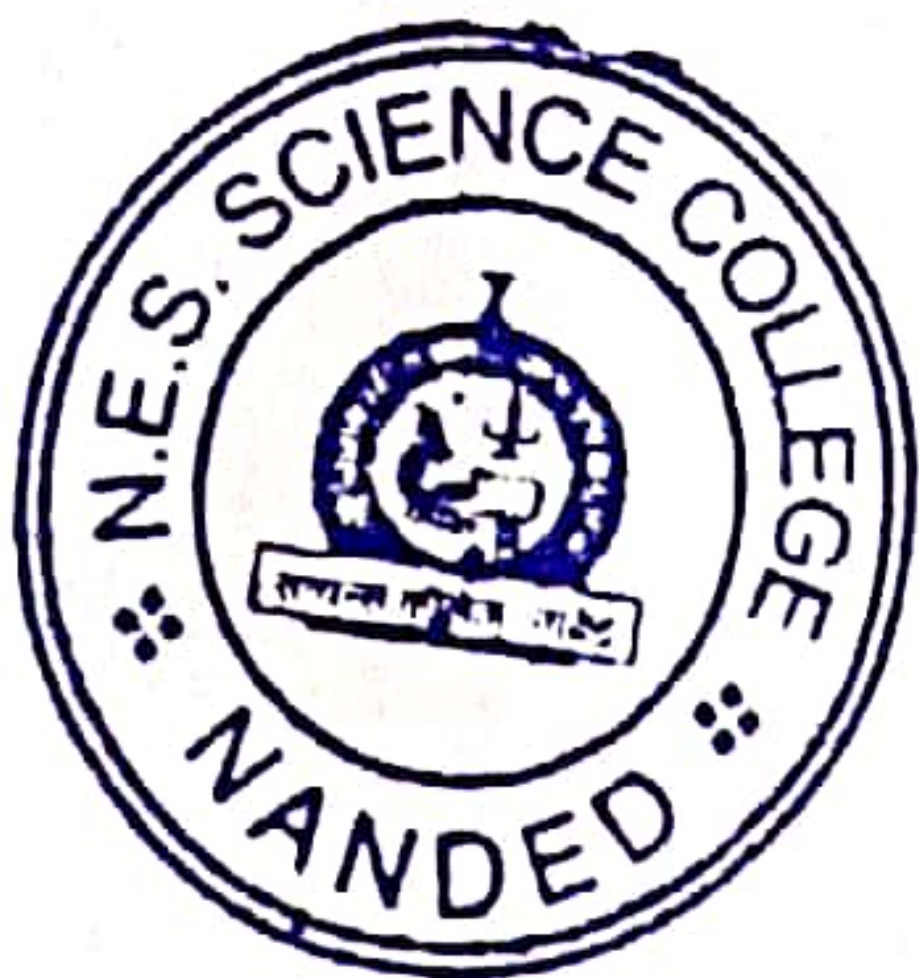

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40	Environmentally Benign Ionic liquid 1-Butyl-3-Methylimidazolium Tetra fluoroborate an Efficient Reaction Medium for the One pot synthesis of Quinazoline Derivatives	Dr. S. R. Pingalkar	Department of Chemistry & Agro. Chemistry & Fertilizers	IJRAR, P No. 1329-1333, Vol.6, Issue 1	2018-19	E-ISSN 2348-1269, P- ISSN 2349-5138
41	A novel ascent for synthesis of pyrazoline derivative by adopting grapheme oxide nanosheet as carbo catalyst at reflux condition	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	International Journal of green & Herbal chemistry Vol. 07 Page 469-476 Sec. B, March - 2018	2018-19	
42	Synthesis and Spectroscopic Characterization of Cu(II) and Ag(II) Metal Complexes with 2-(1H-Beno[D] Imidazol-2-YL)-4, 6-Diodophenol.	Dr. A. S. Bansode	Department of Chemistry, Agrochemistry fertilizer	ISST Journal of Applied Chemistry,	2018-19	0976-7355
43	A Study on Optimization Techniques for Solving Constrained Non-linear Problems	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	International Journal of Current Engineering and Scientific Research, Vol.5, Issue 2, 2018, pp. 76-81	2018-19	ISSN: 2393-8374
44	A review of Algorithms used for Constructing Experimental Designs in Conjoint Analysis, International Journal of Creative Research Thoughts	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	International Journal of Creative Research Thoughts, Vol. 6, Issue 1, Feb. 2018, pp. 784-797	2018-19	ISSN: 2320-2882




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45	Fuzzy Unbalanced Transportation Problem by using Monte Carlo Method.	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	Aayushi International Interdisciplinary Journal, Sp. Issue. 25, pp.06-10	2018-19	ISSN: 2349-638X.
46	Nari Ka Swarup	Dr. Mrs. A. R. Shukla	Department of Hindi	Vidhavarta: interdisciplinary Multilingual Refereed Journal, VOL-11, ISSUE - 21, page No-174	2018-19	2319-9318
47	Adnyeyevammukti bodh ki samkaleenkavita	Dr. Mrs. A. R. Shukla	Department of Hindi	IDEAL, VOL-VI, ISSUE -II	2018-19	2319-359X
48	kavitamaiviklangvi marsh	Dr. Mrs. A. R. Shukla	Department of Hindi	Chronicle of Humanities and Cultural Studies, VOL.4, ISSUE 2, Page No. 190	2018-19	2454-5503
49	Hindi Sahitya mai Nari ki Sthiti	Dr. Mrs. A. R. Shukla	Department of Hindi	Printing Area: interdisciplinary Multilingual Refereed Journal, VOL-04, ISSUE - 38, page No-195	2018-19	2394-5303
50	Estimation of Quercetin from different varieties of Capsicum annum L. using HPTLC fingerritn method	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Ajanta Vol-VIII (1) PP 117-123,	2018-19	




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51	Synthesis of 1,5 benzodizepine derivative using sulphated tin oxide as solid super acid catalyst	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Int.J.ofRes. Anal.Revie w Vol. 06 Issue No. 1, March 2019	2018-19	E-ISSN 2348-1269, P- ISSN 2349-5138
52	Assessment of Water Quali of Vishnupuri Damp using Physico-Chemical parameters	Dr. A. S. Bansode	Department of Chemistry, Agrochemistry fertilizer	Vision Research Research Issue XVI, Vol.-V :1-3 Dec 2018-May2019	2018-19	ISSN2250-169X 5.69
53	Synthesis and Spectroscopic Characterization of Cu(II) and Ag(II) Metal Complexes with 2-(1H-Beno[D] Imidazol-2-YL)-4, 6-Diidophenol.	Dr. A. S. Bansode	Department of Chemistry, Agrochemistry fertilizer	ISST Journal of Applied Chemistry, Vol.-10, No.-1, 44-46, 0976-7355, Jan.-June-2019.	2018-19	0976-7355
54	Effective biodegradation of fluoro surfactant and sodium dodecyl sulphate (SDS) from industrial effluents by using three stage bioreactor.	Dr. A. S. Bansode	Department of Chemistry, Agrochemistry fertilizer	International Journal of Multidiscipl inary ResearchRevi ew, Vol.5, Issue-10, 2019	2018-19	2395-1877
55	Synthesis and Spectroscopic Characterization of Cu(II) and Ag(II) Metal Complexes with 2-(4-Hydroxy-3-Iodo-5-Methoxypheny)-3-(Pyridin-2-YL)Thiazolidin-4-One.	Dr. A. S. Bansode	Department of Chemistry, Agrochemistry fertilizer	ISST Journal of Applied Chemistry, Vol.-10, No.-1, 11-13,	2018-19	0976-7355.



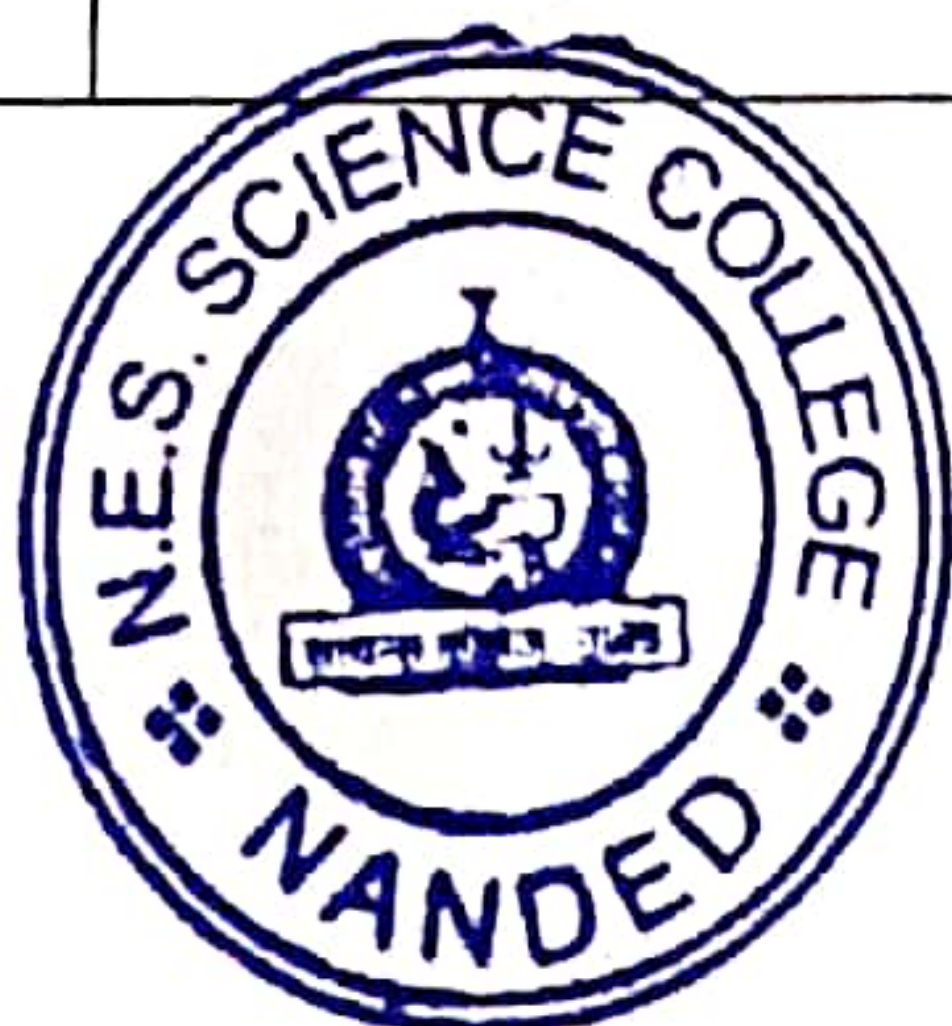

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56	Microwave assisted synthesis and antimicrobial study of some novel 2-azetidinones derived from 2-(1-phenylimino-ethyl)-naphthalen-1-ol	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Orbital	2018-19	0.429 (eISSN 1984-6428)
57	A cleaner and convenient approach to amines:reduction of symmetric diimines using NaBH_4	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Res.J.CheV ol.23(5),	2018-19	0972-0626
58	Variations of protein contents in the muscle of fish <i>Cirrhinus Reba</i> [Hamilton, 1822] from Godavari River at Nanded Region, Maharashtra, India	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Review of ResearchVo l. 8 Issue-7	2018-19	ISSN 2249-894X
59	Axi-symmetric thermoelastic stress analysis of a thin circular plate due to heat generation	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	International Journal of Dynamical Systems and Differential Equations (2019) 9(2) 187-202	2018-19	
60	Mathematical modeling of non-homogeneous steady state heatconduction problem in a thin circular plate with uniform heat source	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	IJAIR, PP-59-64, Vol-5(4-XX), Oct-Dec-2018	2018-19	2394-7780



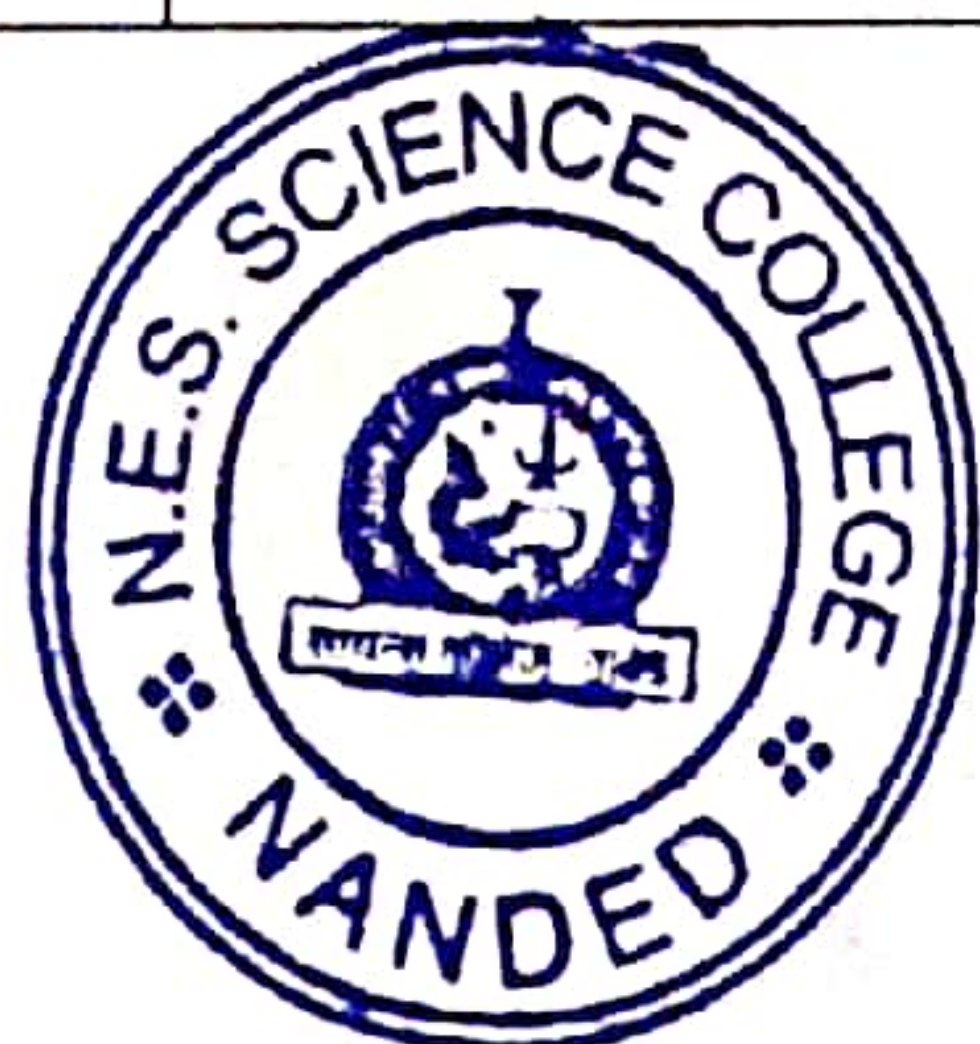

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61	Some Significant Properties of the Intersection Graph Derived from Topological Space Using Intersection of Open Sets	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Far East Journal of Mathematical Sciences (FJMS), Volume-119(1), 2019	2018-19	ISSN: 2349-5162
62	Open Subset Inclusion Graph of a Topological	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal of Discrete Mathematical Sciences and Cryptography, (Taylor and Francis) (2019) 22(6).	2018-19	ISSN: 2663-7170, eISSN: 2663-7189
63	Some Properties of the Union Graph Derived from Topological Space Using Union of Open Sets	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Far East Journal of Mathematical Sciences (FJMS), Volume-121, 2019	2018-19	2349-5162
64	Bharat ki prathamaadhyapika sawitribai Phule	Dr.Mrs.A. R. Shukla	Department of Hindi	AJANTA - Vol-VIII ISSUE- I	2018-19	2277-5730
65	Bhasha aur sanskruti :Dr. Vinod Babbar	Dr.Mrs.A. R. Shukla	Department of Hindi	AJANTA - Vol-VIII ISSUE- I	2018-19	2277-5730
66	Vinod Babbar: Vyaktitva aur Krutiv	Dr.Mrs.A. R. Shukla	Department of Hindi	Printing Area: interdisciplinary Multilingual Refereed Journal, VOL-01,ISSUE - 52,page No-165	2018-19	2394-5303
67	prakrutikesakshatk arebsankedesd me; Dr.vinodbabbar	Dr.Mrs.A. R. Shukla	Department of Hindi	Vidhavarta: interdisciplinary Multilingual Refereed Journal, VOL-	2018-19	2319-9318




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				02,ISSUE - 30,page No- 172		
68	Effect of physical parameters on Citric Acid production by <i>Aspergillus -niger</i> ARUI LC 541742 from Fruit Waste.	Dr. D. U. Gawai	Department of Botany, Micro biology & Biotechnology	JETIR- Issue-06 vol-7 page no:217-221	2019-20	International
69	Bioremediation of Pesticides by Laccases using recent approaches : A review	Dr. P. S. Borkar	Department of Botany, Micro biology & Biotechnology	International Journal of Biotechnology and Research Vol. 10 (1) pg. 29-40	2019-20	ISSN (E) - 2249-796X
70	Preliminary phytochemical investigation and HPTLC studies on two species of <i>Ocimum</i> .	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	The International Journal of Analytical and Experimental Model Analysis..(2020)Volume XII, Issue IV, PP 25-37	2019-20	ISSN-0886-9367
71	Evaluation of Charu Prepared from <i>Acalypha Indica</i> L- An Important Medicinal Plant of Traditional Siddha System Useful in Treating Skin Diseases	Dr. V. R. Marathe	Department of Botany, Micro biology & Biotechnology	Advances in Zoology and Botany 8(3): 116-121.2020	2019-20	ISSN No. 2331-5083; E-ISSN No. 2331-5091
72	Ethno-veterinary medicinal plant species of Hadgaon Taluka, Nanded District, Maharashtra	Dr. V. R. Marathe	Department of Botany, Micro biology & Biotechnology	Int. J. of Life Sciences Volume 8(2): 404-410	2019-20	ISSN2349-




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73	In-Vitro evaluation of selected Chloro-Chalcones for Antioxidant activity	Dr. S. R. Pingalkar	Department of Chemistry & Agro. Chemistry & Fertilizers	JETIR, March 2020, Vol. 7 Issue 3	2019-20	ISSN – 2349-5162
74	Synthesis, UV Visible Spectroscopic Characterization and Antimicrobial Activity of Cu (II) and Ag (II) Metal complexes with 2-(4,5- dihydro-1H-pyrazol-5-yl) phenol.	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	Journal of Emerging Technologies and Innovative Research Volume 7 Issue 3	2019-20	ISSN: 2349-5162
75	Functional and Nutritional Health Benefit of Cold-Pressed Oils	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	Journal of agriculture and ecology VOL:9 PAGE NO:21-29	2019-20	pISSN: 2663-7170, eISSN: 2663-7189
76	Synthesis, characterisation, spectroscopic studies and biological evaluation of Schiff bases derived from 1-hydroxy-2-naphthanone	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Heliyon Vol. 13(1), 2020	2019-20	2405-8440
77	Microwave assisted synthesis of some new bis-1,3-benzoxazines	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Org. Comm Vol.13(1)	2019-20	1307-6175
78	In vitro evaluation of selected chloro chalcones for antioxidant activity	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	JETIR Vol.7 (3),	2019-20	2349-5162
79	Growth Inhibitory Properties of Synthetic Chalcones	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Current Bioactive Compounds	2019-20	ISSN 1875-6646 IF-1




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80	panjabkebalidanibandabhadursingh - jivanwruttaw balidan	Dr.Mrs.A. R. Shukla	Department of Hindi	Vidhavarta: interdisciplinary Multilingual Refereed Journal, VOL-10,ISSUE - 33,page No-170	2019-20	2319-9318
81	Anuwadkekshetrame rojgar ki sambhawnaye	Dr.Mrs.A. R. Shukla	Department of Hindi	Printing Area: interdisciplinary Multilingual Refereed Journal, VOL-01,ISSUE - 63,page No-135	2019-20	2394-5303
82	Developing skilled workforce in academic libraries : The need of the hour	Dr. S. L. Jadhav	Department of Library	Studies in Indian place Names Vol. 40 Issue 49 March 2020	2019-20	ISSN : 2394-3114
83	Investigation of before-competition state anxiety of baseball players	Dr. A. P. Borikar	Department of Sports	Social Growth	2019-20	ISSN:2229-6190
84	An Ethnomedicinal Survey of Wild Vegetables from Nanded Districts	Dr. B. D. Gachande	Department of Botany, Microbiology & Biotechnology	J.of Advanced Scientific Research	2020-21	0976-9595, 0.567, 2015
85	Biosynthesis, characterization, and antibacterial activity of silver nanoparticles from an endophytic fungus Alanphillipsiaaloeigena	Dr. B. D. Gachande	Department of Botany, Microbiology & Biotechnology	Journal of the Maharaja Sayajirao University, Baroda	2020-21	0025-0472
86	Biodegradation of Para-Nitro Aniline from Soil Samples of Nanded District	Dr. B. D. Gachande	Department of Botany, Microbiology & Biotechnology	Int J of Scientific Research in Science and Technology	2020-21	2395-602X



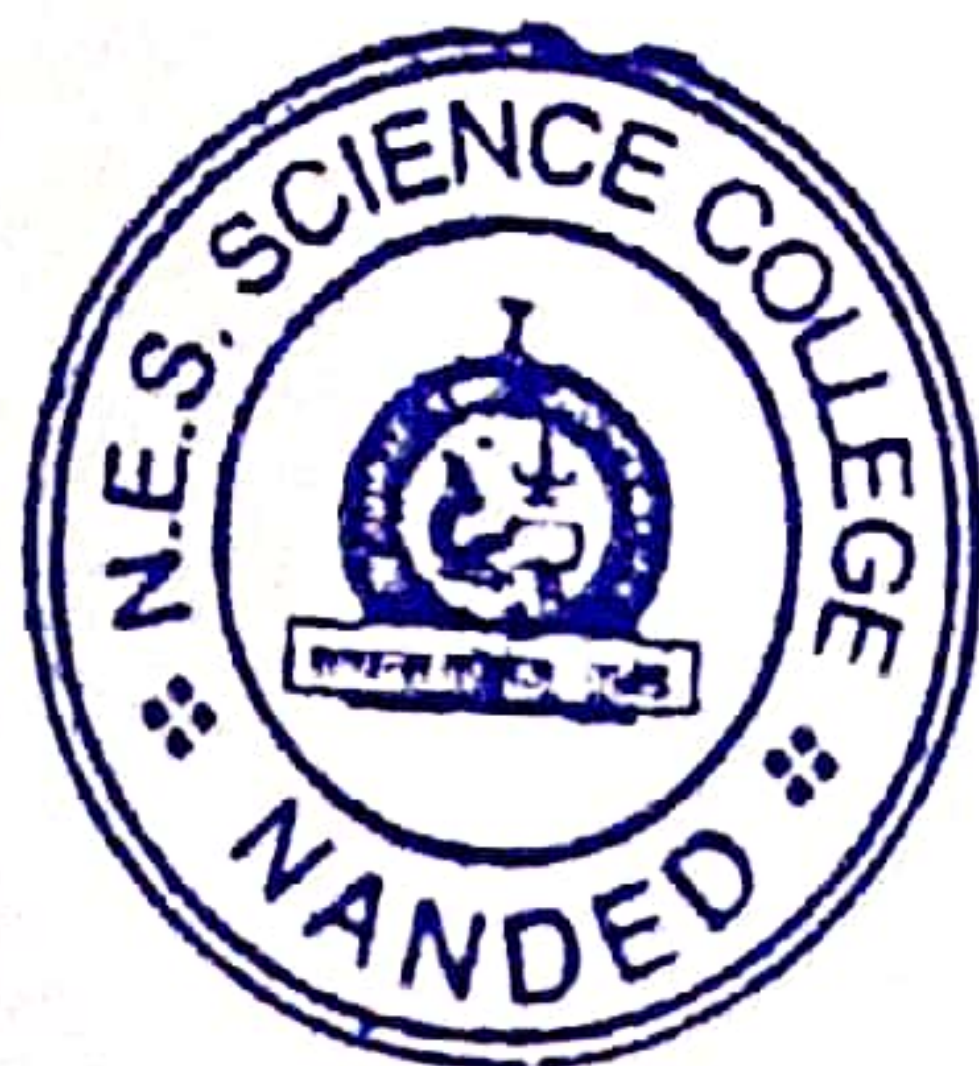

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87	Synthesis of 1, 2, 3-triazolo-piperazines compounds and their screening for Anticancer activity using C6 Glioma cell lines	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	International Journal of Green and Herbal Chemistry Vol. 10 (1) pg. 26-33,	2019-20	E-ISSN: 2278-3229
88	Studies on Nutritional and Medicinal Values of <i>Perillafrutescens</i> (L.)	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	International Journal of Green and Herbal Chemistry Vol. 10 (2) pg. 162-167	2020-21	E-ISSN: 2278-3229
89	Studies on Nutritional and Medicinal Values of <i>Perillafrutescens</i> (L)	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	International Journal of Green and Herbal Chemistry, Sec B: Herbal Chemistry, Vol. 10 (2), pg. 162-176.	2020-21	ISSN (E) - 2278-3229
90	HPTLC Profiling and Antimicrobial Studies of Some Commonly Used Indian Spices	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	International Journal of Scientific Research in Science and Technology. Volume 9 Issue 6 Page No : 337-344 2021	2020-21	ISSN: 2395-6011
91	Fermentation of Banana Must Using Mango Fruit Inoculums	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	International Journal of Scientific Research in Science and Technology. Volume 9 Issue 6 Page No : 337-344 2021	2020-21	ISSN: 2395-6011



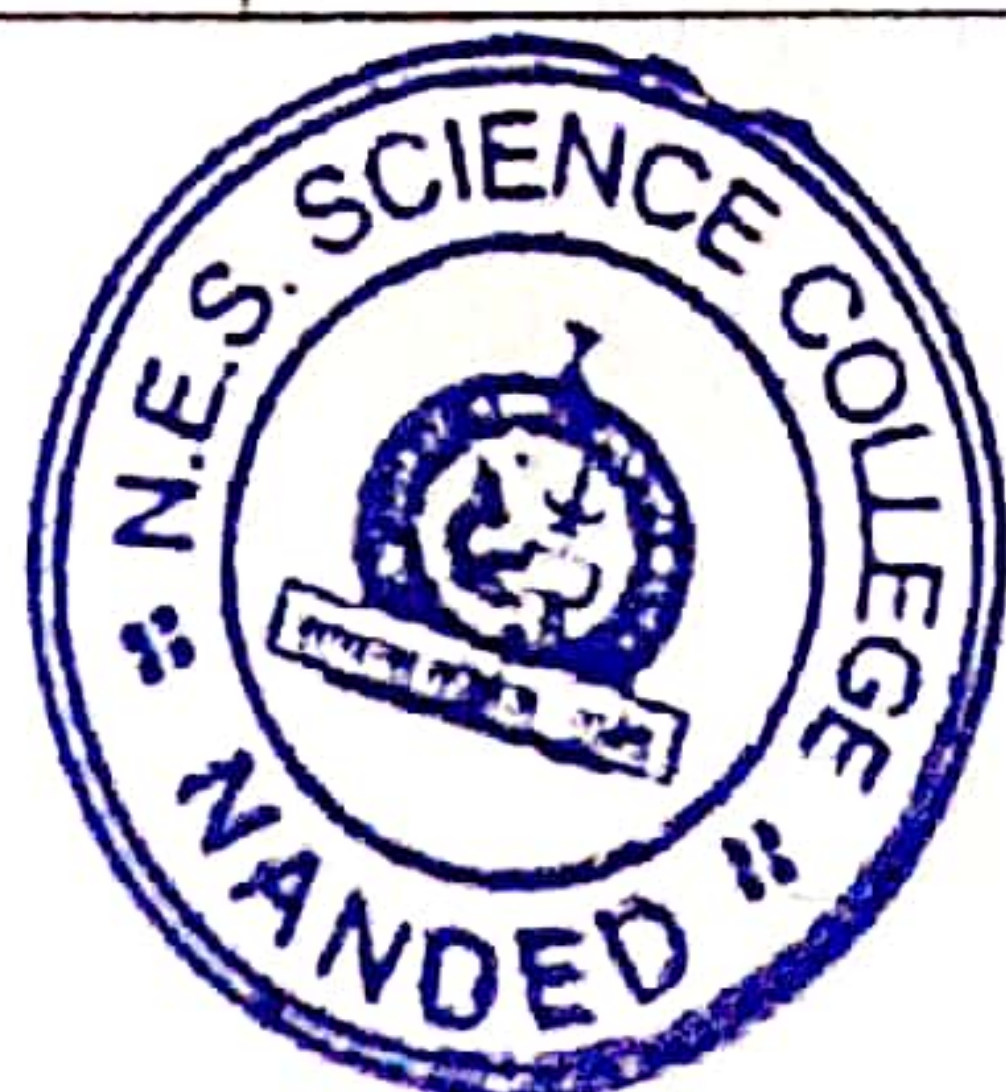
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92	Phytochemical screening and antioxidant activity of <i>Calotropis gigantea</i> Linn. flowers in polar and non-polar solvents.	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	<i>International Journal of Botany Studies</i> . 6(5): 999-1002	2020-21	ISSN: 2455-541X
93	Brine shrimp lethality assay of some selected medicinal plant flowers in polar and Non-polar solvents.	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	<i>International Journal of Botany Studies</i> . 6(6): 572-574	2020-21	ISSN: 2455-541X
94	HPTLC profiling and antimicrobial studies of some commonly used Indian spices	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	<i>Int. J. Sci. Res. in Sci. Tech</i> 9 (6) 337-344.	2020-21	2395-602x
95	fermentation of banana must using mango fruit inoculums	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	<i>Int. J. Sci. Res. in Sci. Tech</i> 9 (6)345-349	2020-21	2395-602x
96	Eco-friendly and Green Procedure for Iodination of Reactive Aromatics Using PEG 400-I2/HIO3 Combination	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Curr. Green Chem. Vol 8, Issue 2 Page 166-173	2020-21	ISSN 2213-347X IF 1
97	An efficient, ultrasound induced ring closure of hydroxy chalcone in 2-ethoxy ethanol as a green reaction medium and study of antimicrobial potential	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	CHEM. DATA Coll. VOL. 31, Page100606	2020-21	ISSN 2405-8003 IF-1.8
98	Synthesis of 1-(2-substitutedphenyl-2,3-dihydro-1H-benzo[b][1,4]diazepin-4-yl)naphthalene-2-ol under different solvent conditions as a potent	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Chem. Data Coll. VOL 33 Page 100690	2020-21	ISSN 2405-8003 IF-1.8



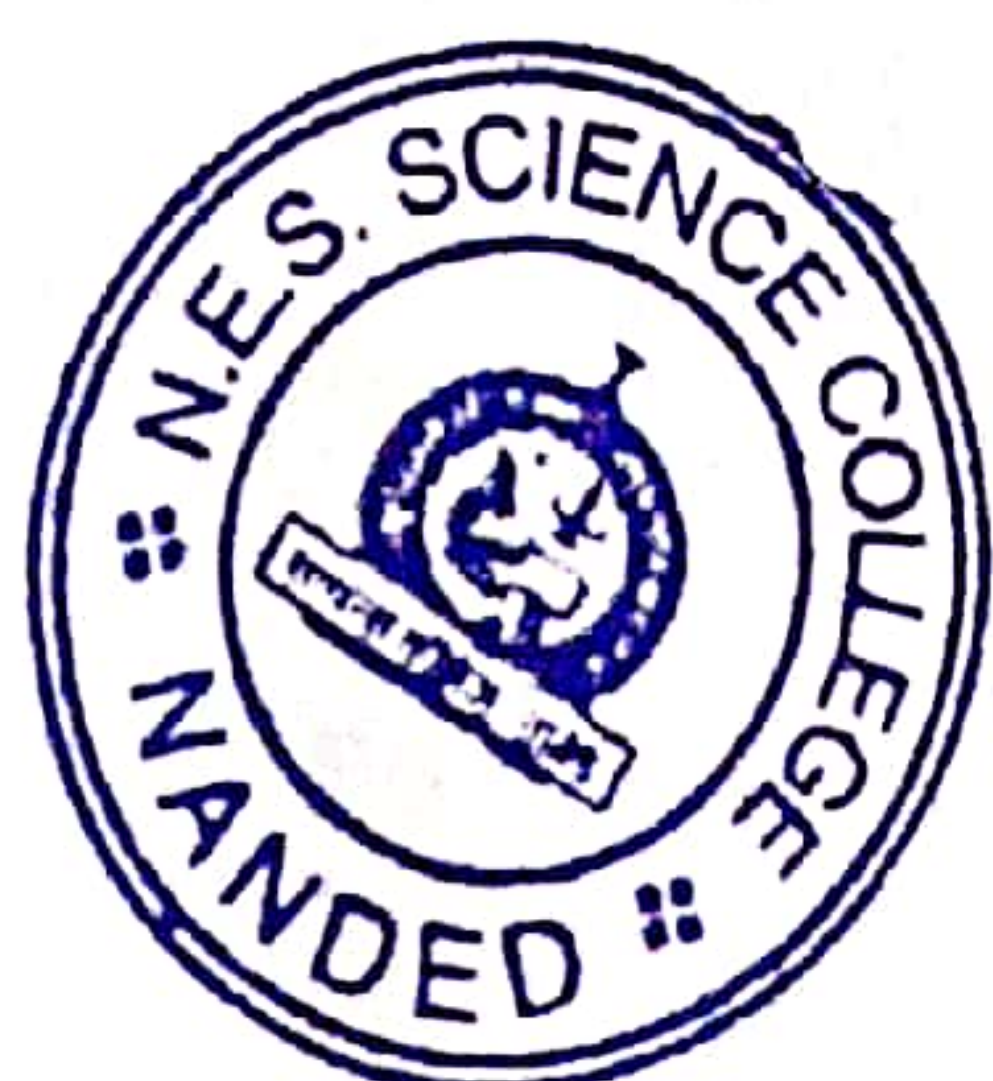

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	antimicrobial agent					
99	HPTLC profiling and antimicrobial studies of some commonly used Indian spices	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	<i>Int. J. Sci. Res. in Sci. Tech 9 (6) 337-344.</i>	2020-21	2395-602x
100	fermentation of banana must using mango fruit inoculums	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	<i>Int. J. Sci. Res. in Sci. Tech 9 (6) 345-349</i>	2020-21	2395-602x
101	Optimization algorithms and their applications	Dr. P. S. Sutkar	Department of Mathematics & Applied Mathematics	Malaya journal of Matematik	2020-21	ISSN:2319-3786
102	Some properties of open subset intersection graph of a topological space	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal Information & Optimization Sciences	2020-21	0.9
103	Automorphism group of the open subset inclusion graph of a topological space	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal Interdisciplinary Mathematics	2020-21	0.9
104	Some significant Results on open subset inclusion graph of a topological space	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal Information & Optimization Sciences	2020-21	0.9
105	Some results on an intersection graph of a topology	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal of Discrete Mathematical Sciences & Cryptography	2020-21	1.2



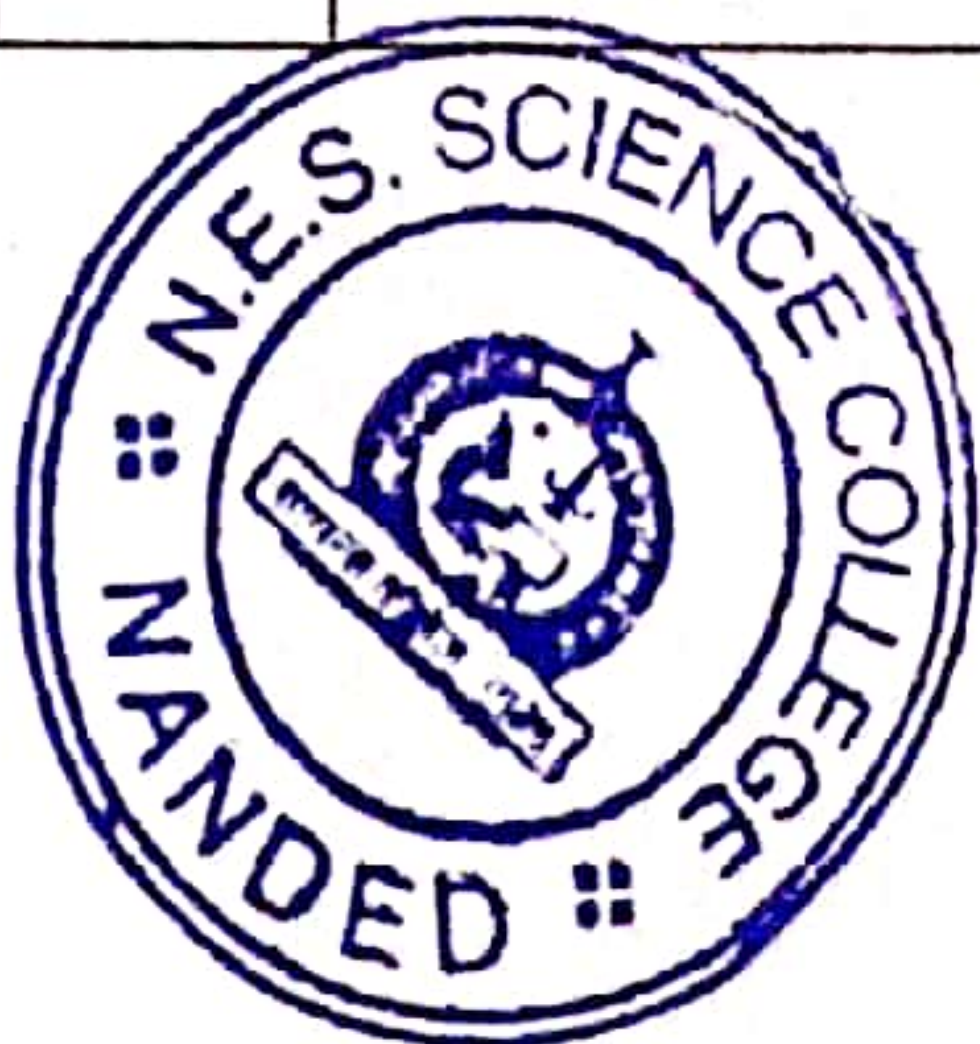

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106	Some properties of open subset intersection graph of a topological space	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal Information & Optimization Sciences	2020-21	1.1
107	A solution of linear & Non-linear partial differential equation of fractional order	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Proyecciones journal of Mathematics	2020-21	0.7
108	A Fractional Approach to solve a Mathematical model of HIV infection of CD4+T Cells	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Journal of Mathematical & Computational sciences	2020-21	0.8
109	Existence & Uniqueness of solutions for Fractional integro Differential Equations with Impulses by a Rosenblatt process	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	NOVIY MIR Research Journal	2020-21	0.5
110	Existence & Uniqueness of solutions for Fractional SDEs with discontinuous drift & finite activity jumps & non linear Fractional Fredholm- Volterra integral Equation with modified argument via Geraghty constructions	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	Zeichen Journal	2020-21	0.5



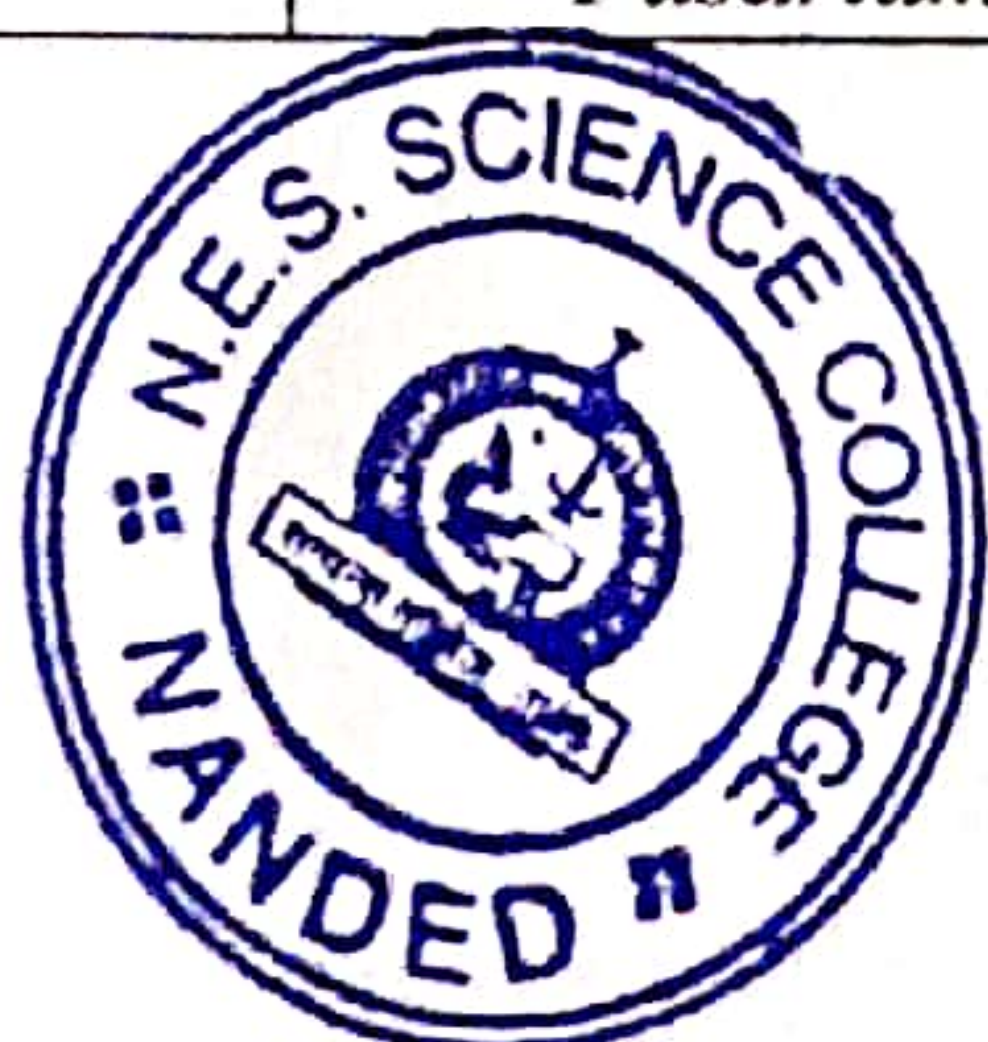

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111	Existence & Uniqueness of solutions of Fractional Differential equation for the Ocean Flow in Artic Gyres & Mild Solutions of Fractional Volteraintegro differential Equations	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	NOVIY MIR Research Journal	2020-21	0.5
112	HIV -I Infection Model Calculating Infected Cells & Viral Load in Plasma using differential Transform Method	Dr. R.A. Muneshwar	Department of Mathematics & Applied Mathematics	NOVIY MIR Research Journal	2020-21	0.5
113	Solution of linear and non-linear partial differential equations of fractional order	Dr. R. A. Muneshwar	Department of Mathematics	Proyeccioness Journal of Mathematics, pp. 1179-1195, Vol. 40, No 5, Issue 40, October 2021.	2020-21	issn.0717-6279-4396
114	Some results of inclusion graph of a topology	Dr. R. A. Muneshwar	Department of Mathematics	Journal of Discrete Mathematical Sciences and Cryptography, pp. 1 – 11, Vol. 11, 2021	2020-21	ISSN 0972-0529 (Print). ISSN 2169-0065 (Online)
115	ON THE DIVISOR GRAPH OF FINITE COMMUTATIVE RING	Dr. R. A. Muneshwar	Department of Mathematics	J. Math. Comput. Sci., pp. 01 - 15, Vol. 7, No. 6, (2021)	2020-21	ISSN: 1927-5307



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116	Directory of open access journals (DOAJ) : An overview	Dr. S. L. Jadhav	Department of Library	Lokmanya College Warora National Webinar	2020-21	Vol 10 Issue 56, April-June 2021, ISSN-2319-4766 Print Impact Factor 7.380
117	Infrastructure requirement for ICT based services in libraries	Dr. S. L. Jadhav	Department of Library	Lokmanya College Warora National Webinar	2020-21	Vol 10 Issue 56, April- June 2021 ISSN-2319-4766 Print , Impact Factor : 7.380
118	Use of N-List & DOAJ e-Journals in Science College Nanded: A case study	Dr. S. L. Jadhav	Department of Library	International Journal of Creative Research Thoughts (IJCRT)	2020-21	Vol. 9 Issue 6 (June) June 2021 Peer reviewed ISSN : 2320-2882 1
119	Role of Government Funding in Research & Publications	Dr. S. L. Jadhav	Department of Library	Dept. of sociology S. N. mor art, commerce & smt. G. D. saraf science college, Tumsar, Dist. Bhandara	2020-21	ISSN 2278-3199 Vol 10 Issue 2 Pp 12-15 Impact Factor 7.264
120	Purification and characterization of Laccase from a novel chlorpyrifos degrading bacterium from pesticide contaminated agricultural soil	Dr. D. U. Gawai	Department of Botany, Microbiology and Biotechnology	International Journal of Green and Herbal Chemistry	2021-22	ISSN: 2278-3229
121	Antifungal Activity of Silver Nanoparticles synthesized with the help of <i>Fusarium</i>	Dr. B. D. Gachande	Department of Botany, Microbiology and Biotechnology	BIOINFOL ET	2021-22	ISSN: 0973-1431



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	<i>brachygibbosum</i>					
122	Phytochemical evaluation, antibacterial and antifungal activity of <i>Rauwolfia tetraphylla</i> L.	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	IOSR journal of Pharmacy And biological Sciences, Vol. 17 (1), pg. 61-67.	2021-22	ISSN (E) 2319-3008
123	Phytochemical and Ethnobotanical studies of some medicinally important <i>Ocimum</i> spp from Kinwat and Mahur Region of Maharashtra.	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	International Journal of Creative Research Thoughts (IJCRT) Volume 10, Issue 2 February 2022	2021-22	ISSN: 2320-2882
124	HPTLC profiling and antibacterial studies of <i>Cassia tora</i> L against some pus forming bacteria	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	International Journal of Botany Studies Volume 7, Issue 2, 2022, Page No. 527-532	2021-22	ISSN: 2455-541X
125	Ethnobotanical documentation of Rubiaceae flora from Kinwat region of Maharashtra.	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Journal of Emerging Technologies and Innovative Research (JETIR) February 2022, Volume 9, Issue 2	2021-22	ISSN-2349-5162
126	Comparative hptlc studies on rhizome of geographically isolated plants of <i>zingiber officinale</i> roscoe	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	International Journal of Current Science (IJCS PUB) Volume 12, Issue 1	2021-22	ISSN: 2250-1770




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127	Root colonization studies on Tomato, Bajra and Maize by <i>Glomus Mosseae</i>	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Journal of <i>Emerging Technologies and Innovative Research</i> (JETIR)	2021-22	(ISSN-2349-5162)
128	Studies on biological control of <i>Fusarium oxysporum</i> form spicri Bioinfolet	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	BIOINFOL ET	2021-22	ISSN: 0973-1431
129	Studies on arbuscular mycorrhizal fungi from soil of Sitakhandi forest of Maharashtra	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Journal of Advanced Scientific Research <i>J Adv Sci Res</i>	2021-22	ISSN 0976-9595
130	Ethnobotanical documentation of some important plants of family Rubiaceae	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	<i>International Journal of Scientific Development and Research</i> (IJS DR) Volume 8 Issue 1	2021-22	ISSN: 2455-2631
131	Moringa Tree, Gift of Nature: a Review on Nutritional and Industrial Potential	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	Current Pharmacology Reports	2021-22	ISSN: 2198-641X
132	Studies on Arbuscular Mycorrhizal Fungi from Soil of Sitakhandi Forest of Maharashtra	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	Journal of Advanced Scientific Research.	2021-22	ISSN: 0976-9595



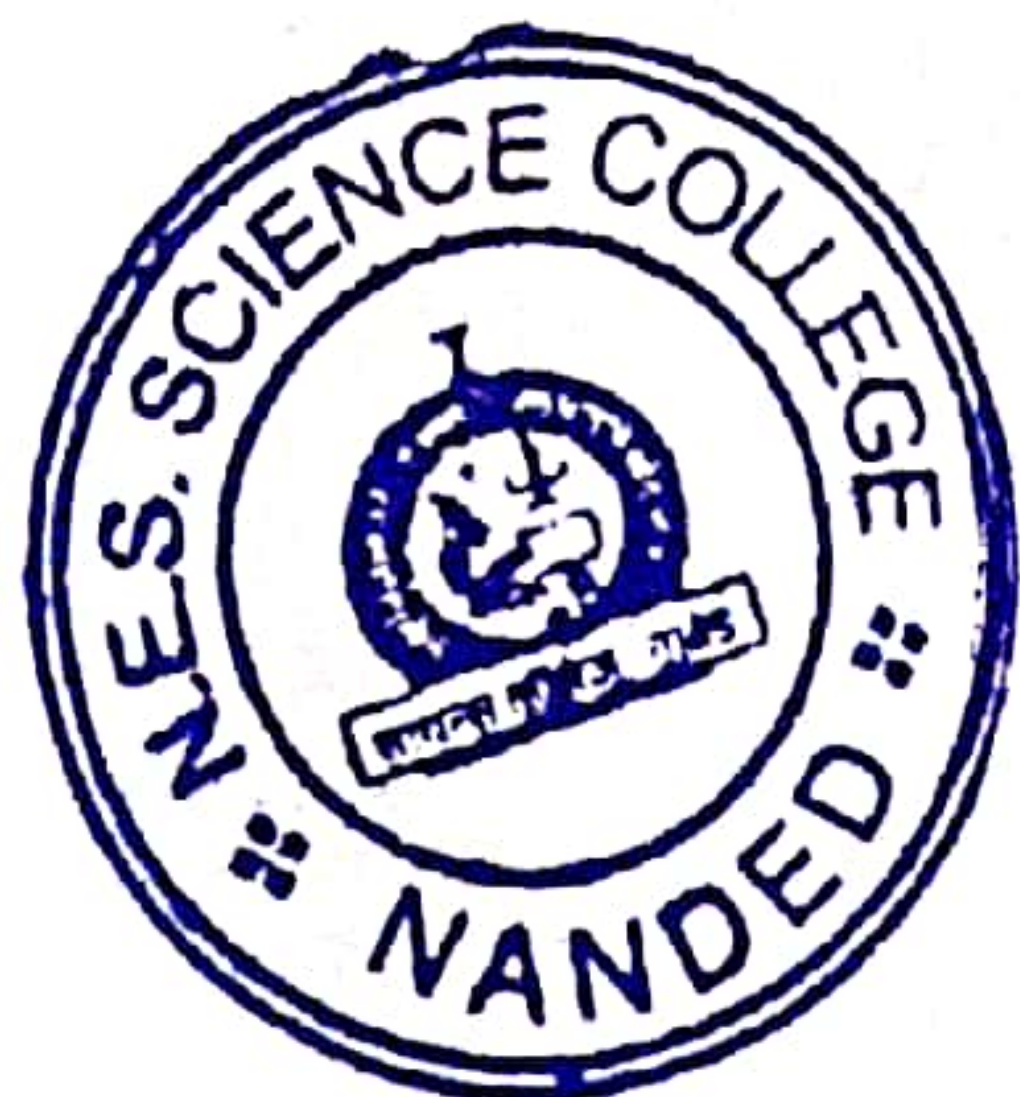

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133	Statistical analysis of Ethno-veterinary plants from Bhil, Pawra, Tadvi and Korku tribes of Buldhana district, Maharashtra: A benevolence for health of native animals	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES, VOL:11 ISSUE:10	2021-22	ISSN:2320-7676
134	Comparative HPTLC studies on rhizome of geographically isolated plants of <i>zingiber officinale</i> roscoe;	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	International Journal of Current Science	2021-22	2405-8440 IF 3.77
135	Role of Arbuscular Mycorrhizal Fungi in Plant Health and Seasonal Comparative Analysis of its occurrence on Selected Plant Species	Dr. R. V. Sangvikar	Department of Botany, Microbiology & Biotechnology	<i>Int. J Novel Research and Devt.</i> , vol.14 7(2):152-161, 2022	2021-22	2456-4184
136	A Brief Review on Ethnomedicinal Plans Used by Tribal Healers for the Maintenance of Primary Health Care in India	Dr. R. V. Sangvikar	Department of Botany, Microbiology & Biotechnology	<i>J.of the Maharaja Sayajirao University, B aroda</i> , 2022	2021-22	0025-0422
137	Antifungal Activity of Silver Nanoparticles synthesized with the help of <i>Fusarium brachygibbosum</i>	Dr. R. V. Sangvikar	Department of Botany, Microbiology and Biotechnology	BIOINFOL ET	2021-22	ISSN: 0973-1431




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138	Role of Arbuscular Mycorrhizal Fungi in plant health and Seasonal comparative analysis of its occurrence on some selected plant species	Dr. R. V. Sangvikar	Department of Botany, Microbiology and Biotechnology	International Journal of Novel Research and Development	2021-22	ISSN: 2456-4184
139	A Brief Review on Ethnomedicinal Plants Used by Tribal Healers for the Maintenance of Primary Health Care in India	Dr. R. V. Sangvikar	Department of Botany, Microbiology and Biotechnology	J.of the Maharaja Sayajirao University, B aroda	2021-22	ISSN: 0025-0422
140	Evaluation of Clean Agent for Replacement of Ozone Depleting Substance halons used in Combat Vehicles	Dr. L. P. Shinde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Vidyabharat i International Interdiscipli nary Research Journal- 24 th September 2022	2021-22	ISSN: 2319-4979
141	Physiochemical Characterization of Metal Complexes with Schiff bases Ligand	Dr. L. P. Shinde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Vidyawarta Peer- Reviewed International Journal- June 2022	2021-22	ISSN: 2319 9318
142	Physiochemical Characterization of Metal Complexes with Schiff bases Ligand and its Biological Importance	Dr. L. P. Shinde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Vidyabharat i International Interdiscipli nary Research Journal- 24 th Septemb er 2022	2021-22	ISSN: 2319-4979



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143	Physiochemical Characterization of Metal Complexes with Schiff bases Ligand	Dr. L. P. Shinde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)- April 2022	2021-22	ISSN: 2581-9429
144	Synthesis, spectral studies, antioxidant and antibacterial evaluation of aromatic nitro and halogenated tetradentate Schiff bases	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	Heliyon	2021-22	2405-8440 IF 3.77
145	Study on Ponderal Index of Fish Puntius sarans(Hamilton) from Godavari River, At Nanded, Maharashtra, India	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Internationsl journal of life Science Research	2021-22	2348-31 Impact factor 4.3
146	Study of Morphometric Characters of Puntius sarana (Hamilton) from Godavari river at Nanded region (Maharashtra State)	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Internationsl journal of life Science Research	2021-22	2348-313
147	2D Problem for a sphere in the fractional order theory thermoelasticity to axisymmetric temperature distribution	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Advances in Mathematics :Scientific Journal, Vol. 11(1), pp. 1-15, 2022.	2021-22	1857-8365




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148	Analysis of non-integer order thermoelastic temperature distribution and thermal deflection of thin hollow circular disk under the axisymmetric heat supply	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Journal of the Korean Society for Industrial and Applied Mathematics, Vol. 26(1), pp.67-75, 2022	2021-22	1226-9433
149	Fractional order transient thermoelastic stress analysis of a thin circular sector disk,	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	International Journal of Thermodynamics, Vol. 25(1), pp.1-8, 2022.	2021-22	1301-9724
150	Two-dimensional generalized magneto-thermo-viscoelasticity problem for a spherical cavity with one relaxation time using fractional derivative,	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	International Journal of Thermodynamics, Vol. 25(2), pp.89-97, 2022	2021-22	1301-9724
151	Two-dimensional generalized magneto-thermo-viscoelasticity problem for a spherical cavity with one relaxation time using fractional derivative,	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	International Journal of Thermodynamics	2021-22	ISSN: 1301-9724



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152	“Micropolar nanofluid enfolded with viscous fluid: Three layer flow”	Dr. P. S. Sutkar	Department of Mathematics and Applied Mathematics	J. of Engg. Sci. and Mathematics	2021-22	ISSN: 2320-0294
153	“Solving systems of fractional differential equations using conformable fractional differential transform method”	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	South East Asian J. of Mathematics and Mathematical Sciences	2021-22	ISSN: 2249-622X
154	“Some Results on Complement of Open Subset Inclusion Graph of a Topological Space”	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of Ganita	2021-22	ISSN: 0717-6279-4396
155	Analytical solutions of covid-19 fractional order mathematical model by conformable fractional differential transform method	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Advances and Application in Mathematical Sciences	2021-22	0974-6803
156	Some properties on modified α -fractional partial derivative with its applications	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	3RD INTERNATIONAL CONFERENCE ON MATHEMATICAL TECHNIQUES AND APPLICATIONS (e-ICMTA-2022)	2021-22	DOI: 10.1063/5.0164634




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157	Conformable fractional order COVID - 19 model: Discretization and stability analysis	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	3RD INTERNATIONAL CONFERENCE ON MATHEMATICAL TECHNIQUES AND APPLICATIONS (e-ICMTA-2022)	2021-22	DOI: 10.1063/5.0164634
158	Some properties of the complement of intersection graph derived from topological space using intersection of open sets	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	3RD INTERNATIONAL CONFERENCE ON MATHEMATICAL TECHNIQUES AND APPLICATIONS (e-ICMTA-2022)	2021-22	DOI: 10.1063/5.0164634
159	On the Divisor Graph of Finite Commutative Ring	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	J. Math. Computer Science	2021-22	ISSN: 1927-5307
160	"Some aspects of the solutions of the Rossler system and chaos"	Dr. P. R. Kulkarni	Department of Mathematics and Applied Mathematics	Econophysics, Sociophysics and other multidisciplinary science.	2021-22	ISSN:2247-2479 & ISSN-L: 2247-2479
161	"On some existence and uniqueness results for non-linear fractional differential equations with boundary conditions"	Dr. P. R. Kulkarni	Department of Mathematics and Applied Mathematics	Econophysics, Sociophysics and other multidisciplinary science.	2021-22	ISSN:2247-2479 & ISSN-L: 2247-2479




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162	“Existence and uniqueness of Fixed Points for a Mapping in b-metric space”	Mrs. V. D. Borgaonakar	Department of Mathematics and Applied Mathematics	International journal of all research education and Scientific methods	2021-22	ISSN 2455-6211
163	Common Fixed Points Theorems for two Mappings in bi b-Metric Space	Mrs. V. D. Borgaonakar	Department of Mathematics and Applied Mathematics	Advances in Mathematics :Scientific Journal, Vol. 11(1), pp. 1-15, 2022.	2021-22	ISSN:1857-8365
164	“Women’s Socio-economic Condition Reflected in 9 Jakhoo Hill	Dr. Mrs. V. V. Kulkarni	Department of English	RICERCA International Journal of Multidisciplinary Research and Innovation	2021-22	ISSN: 2583-083X
165	Physical fitness level indian game kabbadi and foreign game basketball players	Dr. A. P. Borikar	Department of Sports	Interlink Research Analysis page-28 to 33, Vol. No. IV, Issue:XXVI	2021-22	ISSN:0976-0377
166	Vitro Cytotoxic Potential Of Medicinal plant <i>Alangium salvifolium</i> against Cancer Cell Lines	Dr. D. U. Gawai	Department of Botany, Microbiology and Biotechnology	Eur. Chem. Bull.	2022-23	ISSN 2063-5346
167	Purification and characterization of Laccase from a novel chlorpyrifos degrading bacterium from pesticide contaminated agricultural soil	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	International Journal of Green and Herbal Chemistry	2022-23	ISSN(E) - 2278-3229




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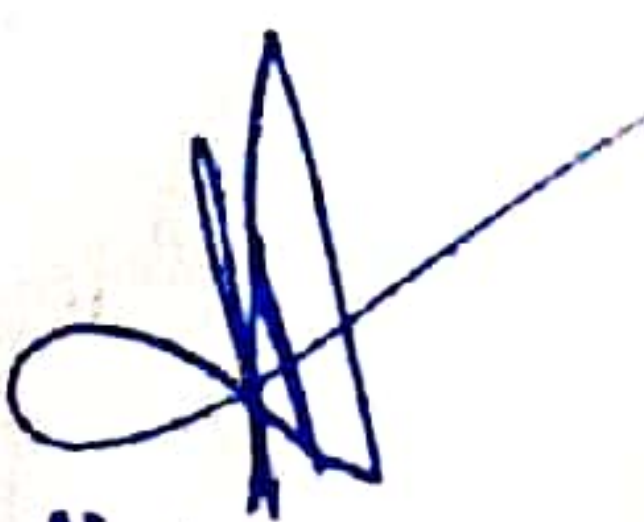
168	Preliminary phytochemistry and Anticancerous Activity of Plants <i>Neolamarckiacadamba</i> Roxb. and <i>Morindacitrifolia</i> Lin.	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Rubiaceae family JETIR	2022-23	ISSN-2349-5162
169	HPTLC profiling and antimicrobial studies on <i>Curcuma aromatica</i> Salisb and <i>Madhuca longifolia</i> (Koenig)	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Int. J. of Life Sciences	2022-23	ISSN: 2320-7817
170	Ethnomedicinal studies of some Myrtaceae plants from Nanded region of Maharashtra	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	int. J. Adv. Res	2022-23	ISSN: 2320-5407
171	Ethnobotanical documentation of some important plants of family Rubiaceae	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	INTERNATIONAL JOURNAL OF SCIENTIFIC DEVELOPMENT AND RESEARCH	2022-23	ISSN Approved Journal No: 2455-2631
172	ETHNOMEDICINAL STUDIES OF SOME MYRTACEAE PLANTS FROM NANDED REGION OF MAHARASTRA	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	International journal of advanced Research vol:11(03)	2022-23	ISSN:2320-5407
173	Preliminary phytochemistry and Anticancerous Activity of Plants <i>Neolamarckiacadamba</i> Roxb. and <i>Morindacitrifolia</i> Lin. from Rubiaceae family	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	JETIR, VOL 10 Issue:04	2022-23	ISSN:2349-5162




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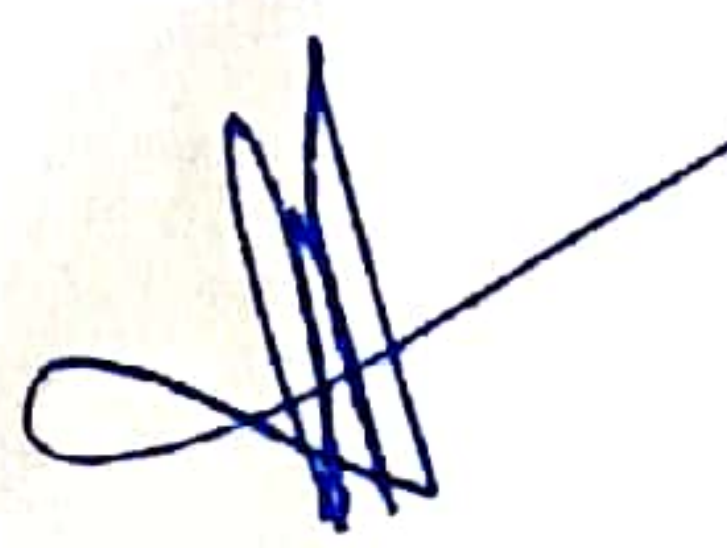
174	NUTRITIONAL VALUE OF SUPERFOOD MORINGA TEA	Dr. P. D. Satav	Department of Botany, Microbiology & Biotechnology	IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES	2022-23	ISSN:2320-7876
175	NUTRITIONAL VALUE OF SUPERFOOD MORINGA TEA	Dr. L. P. Shinde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	IJFANS INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES	2022-23	ISSN:2320-7876
176	Physiochemical Characterization and Evaluation of Metal Complexes with Schiff bases Ligand	Dr. L. P. Shinde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	The International Journal of Analytical and Experimental Modal Analysis- April, 2023	2022-23	ISSN: 886-9367
177	Synthesis Characterization, Powder X-Ray diffraction analysis, ESR Study, Thermal Stability and Ni (II) & Fe (III) Schiff base ligand complexes and potency study as Antibacterial and Antioxidant agents	Dr. A. T. Shinde	Department of Chemistry, Agrochemistry fertilizer	"Polycyclic Aromatic Compounds"	2022-23	Print ISSN: 1040-6638 Online ISSN: 1563-5333
178	Effect of planting methods on economics of paddy	Mr. K. K. Jadhav	Department of Chemistry, Agrochemistry fertilizer	Indian journal of agriculture and allied sciences	2022-23	2395-1109




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179	Study on relationship between length and weight of puntiussarana (nHamilton) from Godavari river at Nanded region (M.S) India	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	International journal of life Science Research	2022-23	ISSN: 2348-313X
180	A study of sex of fresh water fish puntiussarana from Godavari river at Nanded region, Maharashtra State (India)	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	International journal of life Science Research	2022-23	ISSN: 2348-313X
181	Reproduction of neon tetra (paracheirodonInnesi) under controlled conditions	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	International journal of life Science Research	2022-23	ISSN: 2348-313X
182	Effect of temperature on incubation period and hatching of neon tetra Paracheirodoninnesi eggs	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	International journal of life Science Research	2022-23	ISSN: 2348-313X
183	OREOCHROMIS NILOTICUS [LINNAEUS, 1758] ITS BIOMEDICAL BENEFITS FOR CHILDREN'S	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	The American Journal of Interdisciplinary Innovations Research	2022-23	(ISSN – 2642-7478)
184	Nesting and Breeding of Common coot (Fulicaatra) (Aves: Rallidae) in Ujani-Bhigwan reservoir Maharashtra, India	Mr. R.M. Achegawe	Department of zoology	Journal of Advanced Zoology,	2022-23	0253-7214




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185	“Transient thermoelastic bending analysis of a rectangular plate with a simply supported edge under heat source: Green's function approach”	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	International Journal of Nonlinear Analysis and Applications	2022-23	ISSN: 2008-6822
186	“Fractional Thermoelasticity: A Review”	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	Easy Chair, pp-1-9,	2022-23	ISSN: 2398-7340
187	Amplification of heat transfer in three immiscible fluids: Micropolar nanofluid encased with porous matrix	Dr. P. S. Sutkar	Department of Mathematics and Applied Mathematics	Journal of Nanofluid	2022-23	ISSN: 2169-432X
188	“Micropolar Nanofluid wedged between Permeable fluid Saturated with Nanoparticles”	Dr. P. S. Sutkar	Department of Mathematics and Applied Mathematics	Journal of Nanofluids	2022-23	ISSN: 2169-432X (Print) EISSN: 2169-4338 (Online)
189	“Solution of Fractional Differential Equation Using Conformable Differential Transform Method with Adomain Polynomial	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of Mathematical and Computing, Springer Nature Publication	2022-23	ISSN : 0932-474701
190	“Generalized Results on Existence & Uniqueness with Wronskian and Abel Formula for α -Fractional Differential Equations	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of Mathematical and Computing, Springer Nature Publication	2022-23	ISSN :0130-7673



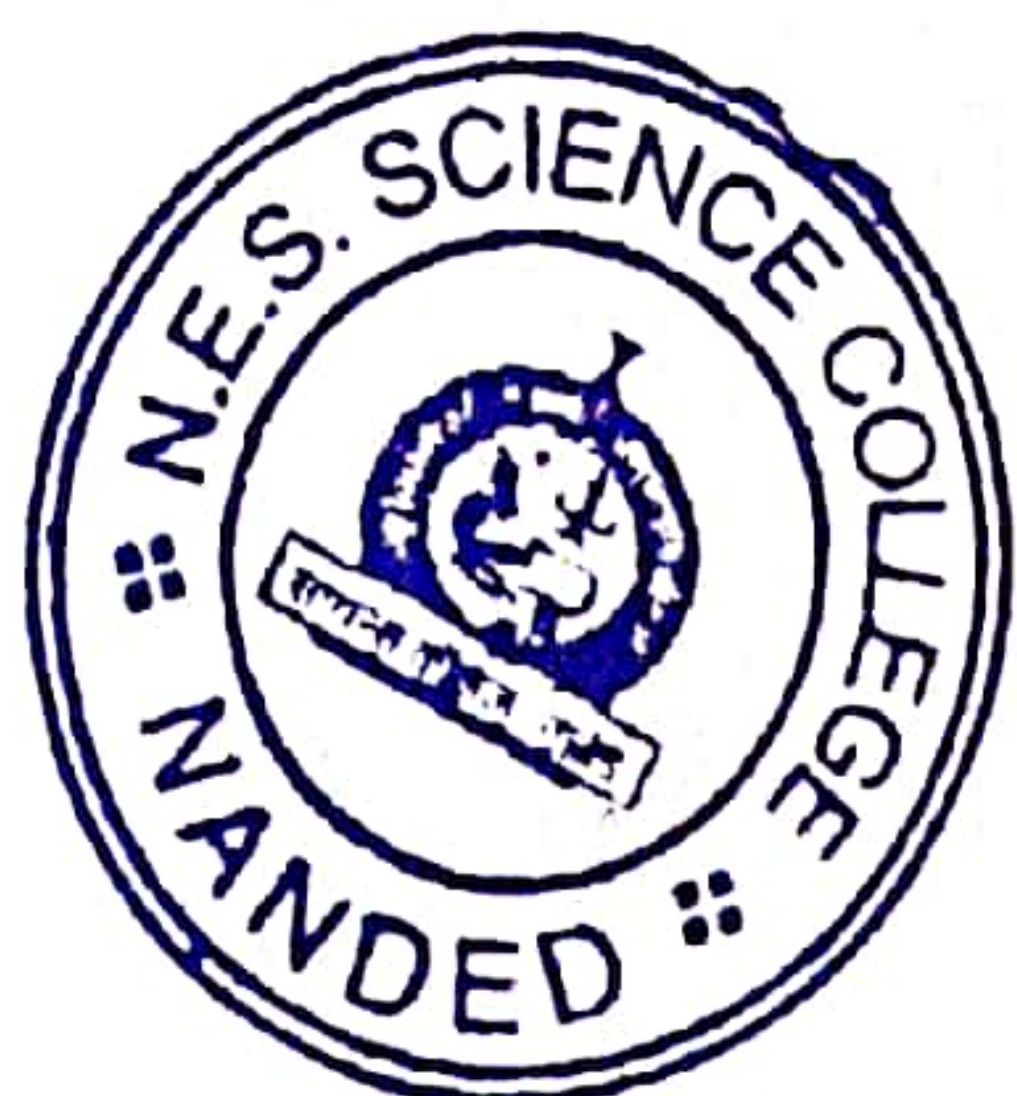

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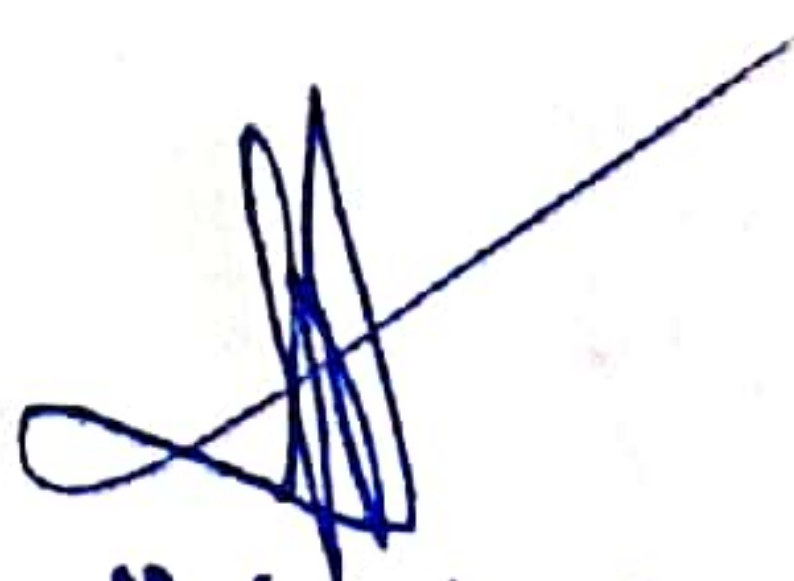
191	Analytical solutions and numerical simulation of COVID-19 fractional order mathematical model by Caputo and conformable fractional differential transform method	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Advances and applications in mathematical sciences	2022-23	ISSN: 0974-6803
192	Analysis of Mild Solution of Fractional Neutral Stochastic Functional Differential Equation with Random Impulses	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Advances and Application in Mathematical Sciences	2022-23	ISSN: 0974-6803
193	Existence and Uniqueness of Square-mean Pseudo Almost Automorphic Solution for Fractional Stochastic Evolution, by	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Advances and Application in Mathematical Sciences	2022-23	ISSN: 0974-6803
194	Geometric meaning and variation of parameter method of modified α -fractional derivative	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of Information and Optimization Sciences	2022-23	ISSN 0252-2667 (Print), ISSN 2169-0103 (Online)
195	Analytical solutions and numerical simulation of COVID-19 fractional order mathematical model by Caputo and conformable fractional differential transform method	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of information and optimization sciences, VOL:44	2022-23	ISSN:0252-2667




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196	"Some properties of bases intersection graph-I	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of Information and Optimization Sciences	2022-23	ISSN 0252-2667 (Print), ISSN 2169-0103 (Online)
197	Some results on the open subset intersection graph of a product topological space	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Journal of Information and Optimization Sciences Volume 44, 2023 Issue 4	2022-23	ISSN:0252-2667
198	NEW EXISTENCE AND UNIQUENESS RESULTS FOR NONLINEAR FRACTIONAL DIFFERENTIAL EQUATIONS WITH COMPOSITE BOUNDARY CONDITIONS	Dr. P. R. Kulkarni	Department of Mathematics and Applied Mathematics	Journal of technology	2022-23	ISSN: 10123407
199	High performance blue light photodetector based on PANI/CdS heterojunction	Dr. V. N. Narwade	Department of Physics	Materials Science in Semiconductor Processing	2022-23	10.1016/j.mssp.2023.108020
200	Bifunctional Supercapacitor and Photocatalytic Properties of Cuboid Ni-TMA MOF Synthesized using a Facile Hydrothermal Approach	Dr. V. N. Narwade	Department of Physics	Journal of electronic materials	2022-23	10.1007/s11664-023-10766-3




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201	Allusion of Technology Education in Chetan Bhagat's <i>What Young Indian Wants</i> and A.P.J. Kalam's <i>We Can Do It: A Comparative Study</i>	Dr. Mrs. V. V. Kulkarni	Department of English	IJAR- Indian Journal of Applied Research (Vol.13, Issue-02)	2022-23	ISSN: 2249-555X
202	"A Critical Study of Anuja Chauhan's <i>The Zoya Factor</i> as the Indian Cricket Fiction"	Dr. Mrs. V. V. Kulkarni	Department of English	International Journal of Advance and Applied Research	2022-23	ISSN: 2347-7075
203	Analysing the Affective Fallacy in Literary Criticism of Anuja Chavan's Fiction the Zoya Factor	Dr. Mrs. V. V. Kulkarni	Department of English	Excel's International Journal of Social Science and Humanities	2022-23	ISSN: 2277-7539
204	Navigating the Nexus: A critical inquiry into the intersection of education and political power in ravindersingh,s your dreams are mine	Dr.Mrs.V. V. Kulkarni	Department of English	international journal of advanced research (IJAR) VOL- 11,ISSUE - 12,page No- 68-70	2022-23	2320-5407
205	Echoes of war and wing of love: A critical study of anujachauhan's romantic novel baaz	Dr.Mrs.V. V. Kulkarni	Department of English	Research journal of english language and literature vol.11,issue 4	2022-23	2331-3108
206	Chronicles of the present : a critical exploration of contemporaneity in those pricey thakur girls by anujachauhan	Dr.Mrs.V. V. Kulkarni	Department of English	TIJER- international research journal VOL- 10,ISSUE - 12,page No-	2022-23	2349-9249




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207	Swadhinataandolan aur hindi kavya	Dr.Mrs.A. R. Shukla	Department of Hindi	international peer reviewed journal issue 399B	2022-23	2278-9308
208	Effect of Weight Training on start skill among competitive swimmers	Dr. A. P. Borikar	Department of Sports	Vision Research Review	2022-23	ISSN: 2250-169x
209	Pharmacognostic and GC-MS studies on Psidium guajava L. (Guava)	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	International Journal of Botany Studies vol:09, issue:05	2023-24	ISSN: 2455-541X
210	Preliminary phytochemical screening and pharmacognostic studies of Eucalyptus rudisendl(Nilgiri)	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	Global Online Electronic International Interdiscipli nary Research Journal Vol:XII SP issue:III	2023-24	ISSN:2778-5639
211	Primary phytochemical and pharmacognostic studies on Syzygiumcumini Linn. (Jambhul)	Dr. D. M. Jadhav	Department of Botany, Micro biology & Biotechnology	Journal of Pharmacogn osy and Phytochemi stry 2024; 13(1): 299- 305	2023-24	E-ISSN: 2278- 4136 P-ISSN: 2349-8234 https://www.phyto journal.com



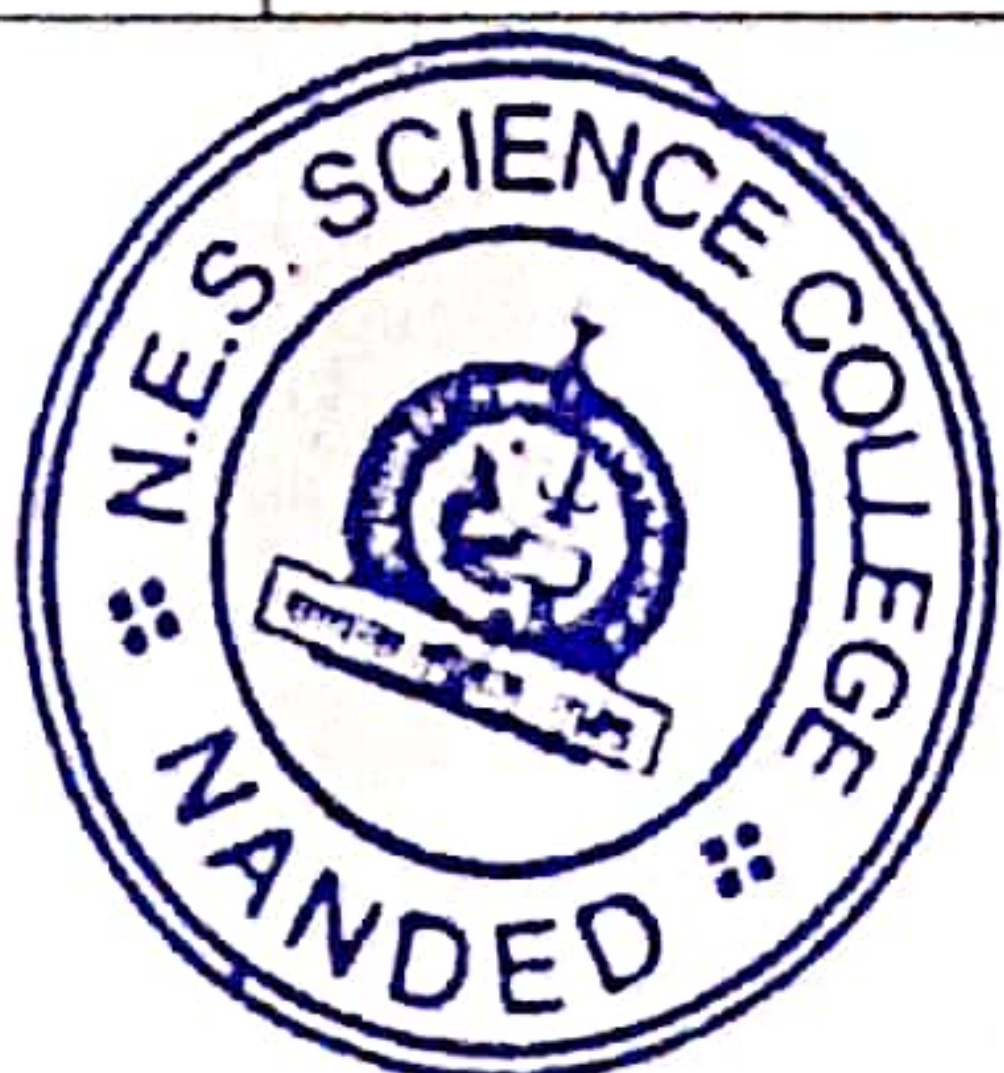

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212	THE LOSS OF MEDICINAL PLANT DIVERSITY FROM MAHUR AND KINWAT FOREST RANGES OF NANDED DISTRICT (MAHARASHTRA)	Dr. V B. Chavan	Department of Botany, Microbiology & Biotechnology	I J R B A T, Special Issue Feb 2016: 128-130	2023-24	ISSN:2447-517X
213	Ethnoveterinary practices for reproductive Ailments by villagers nearby Ambabarva Wildlife Sanctuary, Buldhana District, MS, India	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	Int. J. of Life Sciences Volume 12(1):	2023-24	ISSN2349-
214	Assesment of the nutritional qualities and health advantages of finger millets	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	goeiiirjVOL: XIII Issue;II	2023-24	ISSN:2278-5639
215	Preliminary phytochemical screening and pharmacognostic studies of Eucalyptus rudisendl(Nilgiri)	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	Global Online Electronic International Interdisciplinary Research Journal Vol:XII SP issue:III	2023-24	ISSN:2778-5639
216	Preparation of vermicompost enriched with microbial consortia for pomegranate plant (Punica Grantum L) cv Bhagawa	Dr. P. D. Satav	Department of Botany, Microbiology & Biotechnology	INTERNATIONAL JOURNAL OF RESEARCH AND ANALYTICAL REVIEWS	2023-24	ISSN:2349-5138



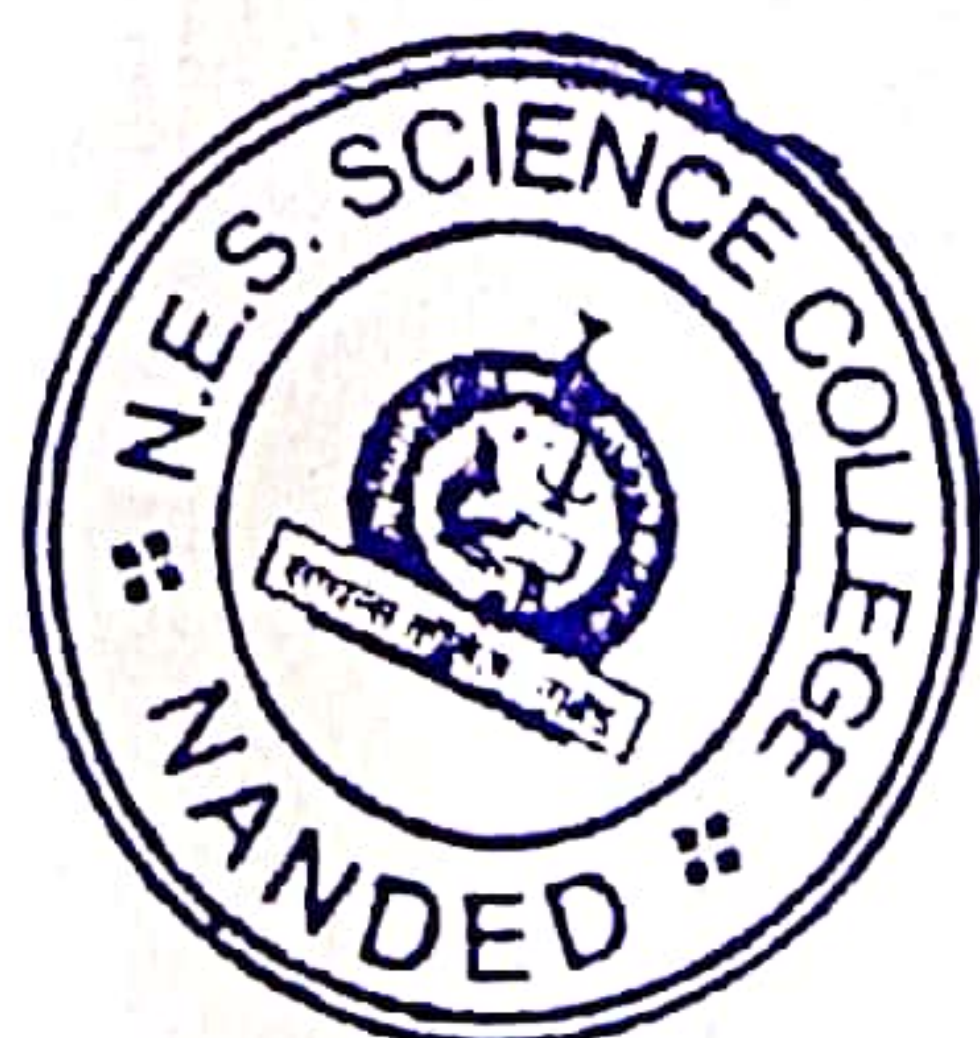

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217	Fecundity of fish notopteruschitala (Hamilton,1822) from gadavari river at nandedmaharashtra,India	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	International journal of life Science Research	2023-24	ISSN:23483148
218	Drug-resistant Bacterial Pathogens: Isolation and characterization in freshwater fish <i>Catlacatla</i>	Mr. R.M. Achegawe	Department of zoology	International Journal of Fisheries and Aquatic Research	2023-24	2456-7248
219	Simulation of Fractional Order 2D-Mathematical Model Using α -Fractional Differential Transform Method	Dr. R. A. Muneshwar	Department of Mathematics and Applied Mathematics	Contemporary Mathematics, Vol:5 Issue:01	2023-24	DOI: 10.37256/cm.5120242464
220	Solution of Fractional Order Differential-Difference Equation by Using Laplace Transform Method.	Dr. P. R. Kulkarni	Department of Mathematics and Applied Mathematics	Journal of harbin engineering University	2023-24	ISSN:1006-7043
221	Fixed point theorem in b2 - metric space	Mrs. V. D. Borgaonakar	Department of Mathematics and Applied Mathematics	volume:12 issue:04	2023-24	NA
222	A review of human iris identification and recognition using soft computing techniques	Dr. U.S Patki	Department of Computer	International journal of science and research archive	2023-24	2582-8185
223	Layer-by-Layer Immobilization of DNA Aptamers on Ag-Incorporated Co-Succinate Metal-Organic Framework for Hg(II) Detection	Dr. V. N. Narwade	Department of Physics	MDPI	2023-24	10.3390/s24020346



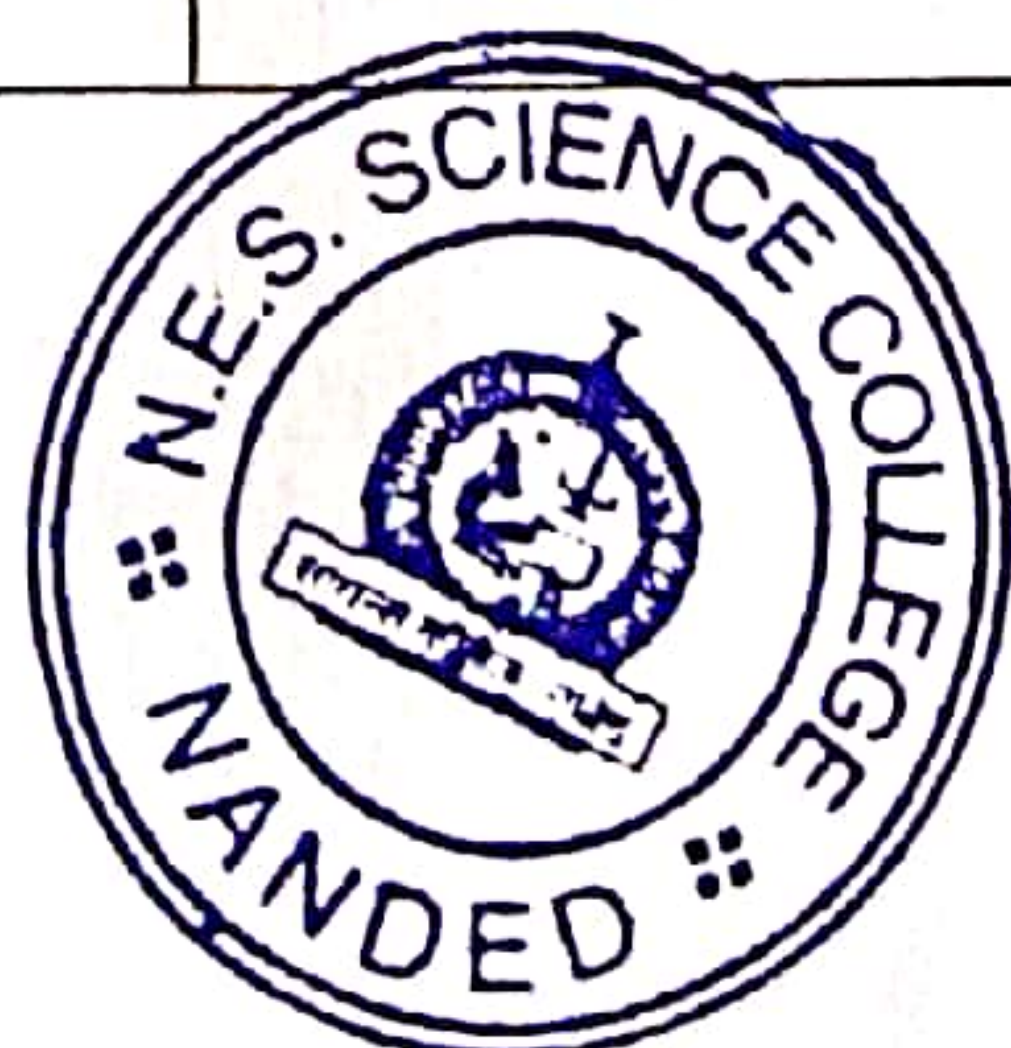

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224	Nitrocellulose□Pas sivated SnO2 Thin Film as a Ultraviolet□C Photodetector	Dr. V. N. Narwade	Department of Physics	Advanced engineering materials	2023-24	1438-1656
225	Waste to Wealth: Upcycling Waste Toner into Magnetic Fe ₃ O ₄ and Conducting Polymer Hybrids for Enhanced Energy Storage Application	Dr. V. N. Narwade	Department of Physics	Journal of Electronic Materials	2023-24	10.1007/s11664- 024-10953-w
226	Highly sensitive, selective, repeatable and flexibechemiresisti ve NO2 sensor based on reduced graphene oxide/free based porphyrin composite	Dr. V. N. Narwade	Department of Physics	Journal of Materials Science: Materials in Electronics	2023-24	1573-482X
227	Enhanced CO sensing with highly sensitive and selective rGO-Ru OEP chemiresistive sensor	Dr. V. N. Narwade	Department of Physics	Chemical physics impact	2023-24	10.1016/j.chphi.20 23.100419
228	Reduced graphene oxide (rGO) and 5, 10, 15, 20-tetra-p- tolyl-21H, 23H- porphine (TTP) composite: highly reproducible and repeatable chemiresistive SO ₂ sensor	Dr. V. N. Narwade	Department of Physics	Applied Physics A Material Science & Processing	2023-24	10.1007/s00339- 023-07194-9




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229	Digital heart : A youthfull journey through love and identity in love @Facebook by Nikita singh	Dr.Mrs.V. V. Kulkarni	Department of English	international journal of Reasrch in English VOL-6,ISSUE - 1,page No-04-06	2023-24	2661-8717
230	An Efficien protocol for synthesis of 1,4-dihydropyriden derivatives by using Graphene oxide Nano particle as a catalyst	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Journal of Chemistry and chemical sciences vol 7(11) page no 1064-1070	2018-19	ISSN 2229-760X (Print) ISSN 2319-7625 (Online)
231	Ionic liquid 1-butyl-3-mehylimidazolium bromide as green and neutral reaction media for catalyst free synthesis of 2-aminochromene derivatives	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Journal of Chemistry and chemical sciences vol 7(11) page no 942-946	2018-19	ISSN 2229-760X (Print) ISSN 2319-7625 (Online)
232	“Development of environment Friendly Clean agent for replacement of Halons used in combat tanks”	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	In International Journal of Universal Science and Technology. ISSN:2454-7263 Vol. No.03 Issue No.02 Page No. 74-76 Jan-2018	2018-19	ISSN: 2484-7263
233	“Nutritional and economic aspects of quinoa (Chenopodium Quinoa)”	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	International journal of Universal science and Technology. ISSN :2454-7263 Vol.No 03, Issue No.06, Page No.293-300, Jan-2018.	2018-19	ISSN: 2484-7263




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234	Simple and efficient one pot synthesis of 3,4-dihydrophyrimidin using Graphine oxide at reflux condition	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	International Journal of Universal science and technology vol 3 (07) page no 332-338	2018-19	ISSN: 2454-7263
235	"Analysis of water quality using physico-chemical parameters at Ratoli village",	Dr. S. R. Pingalkar	Department of Chemistry & Agro. Chemistry & Fertilizers	International journal of scientific research Vol. 7, Issue 2, Feb-2018, P. No. 26-28.	2018-19	ISSN: 2277-8179
236	Synthesis of Acridine derivatives using Ionic liquid as promoter	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	International Journal of green and hearbal chemistry vol 7(2) P 188-193	2018-19	ISSN: 2278-3229
237	An efficient synthesis of Benzimidazole derivatives by using metaltriflate catalyst in aq media	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	International Journal of chem. Tech research vol 10(6) p 114-1149	2018-19	ISSN: 0974-4290
238	Green efficient synthesis of xanthenes derivatives using 1-Butyl-3-methylimidazolium bromide under solvent free condition	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	Asian journal of Medicinal chemistry	2018-19	ISSN: 2456-8937




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239	An Efficient and Simple Method for Synthesis of 2-Phenyl-2,3-Dihydroquinazolin-4(1H)-Ones Catalyzed by Imidazolium Ionic Liquids	Dr. D. R. Munde	Department of Chemistry, Agro Chemical Fertilizer and Analytical Chemistry	IJRAR, P No. 498-502, Vol.6, Issue 1	2018-19	ISSN: 2349-5138
240	Application of hazard and critical control point analysis (HACCP) in organic farming	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	Journal of Agriculture and Ecology, 2020, Vol. 9,	2019-20	ISSN: 2456-9410
241	Comparison of Solvent Extraction and Solid-Phase Extraction for the Determination of Polychlorinated Biphenyls in Transformer Oils.	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	Research Journal Of Pharmaceutical, Vol.5, Issue-10, 2012	2019-20	0975-8585
242	Detection And Confirmation of Transfluthrin in Viscera – A case study	Dr. L. P. Shinde	Department of Chemistry & Agro. Chemistry & Fertilizers	International Journal of Forensic Sciences, Vol.5 (1), 1-7, 2020	2019-20	2573-1734
243	Artificial Neural Network an Advanced Tool for Disease Diagnosis' Review.	Dr. D. D. Pawar	Department of Statistics & Computer Science	International Journal Of Current Medical And Applied Sciences, 2020, June, 27, 14-18	2019-20	IJCMAAS, E-ISSN: 2321-9335, P-ISSN 2321-9327
244	"A Critical Study of India's Technological Advancement in Gurcharan Das' <i>India Unbound</i> "	Dr. Mrs. V. V. Kulkarni	Department of English	International Journal of Research and Analytical Reviews (IJRAR) E-, P- 2349-5138	2023-24	UGC referred journal




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245	<i>A Vivid Description of India in the Narratives of Indian Writers</i>	Dr. Mrs. V. V. Kulkarni	Department of English	Chronicle of Humanities and Cultural Studies(CH CS): Bimonthly Refereed International Journal Page-5to7 Vol. No-7 Issue 2	2023-24	ISSN:2454-5503 Impact Factor 4.197 IJIF
246	Measurment of density and conductance of some heterocyclic compounds	Dr. D. R. Munde	Department of Chemistry &Agro. Chemistry & Fertilizers	VIIRJ / special issue / pafe no 205-209	2023-24	ISSN : 2319-4979
247	Fresh water fish fauna of karadkhed dam, Deglur,Nanded,Ma harashtra,India	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.Life Science Research Vol. 6, Issue 4, pp: (291- 293)	2023-24	IF-4.7, ISSN 2348-313X (Print) ISSN 2348-3148 (online)
248	Fractional order thermoelatic problem of thin hollow circular disk and its thermal stresses under axi- symmetric heat supply	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Design Engineering (Toronto), Vol. 2021(9), pp.13851- 13862, 2021.[Scopu s]	2023-24	0011-9342



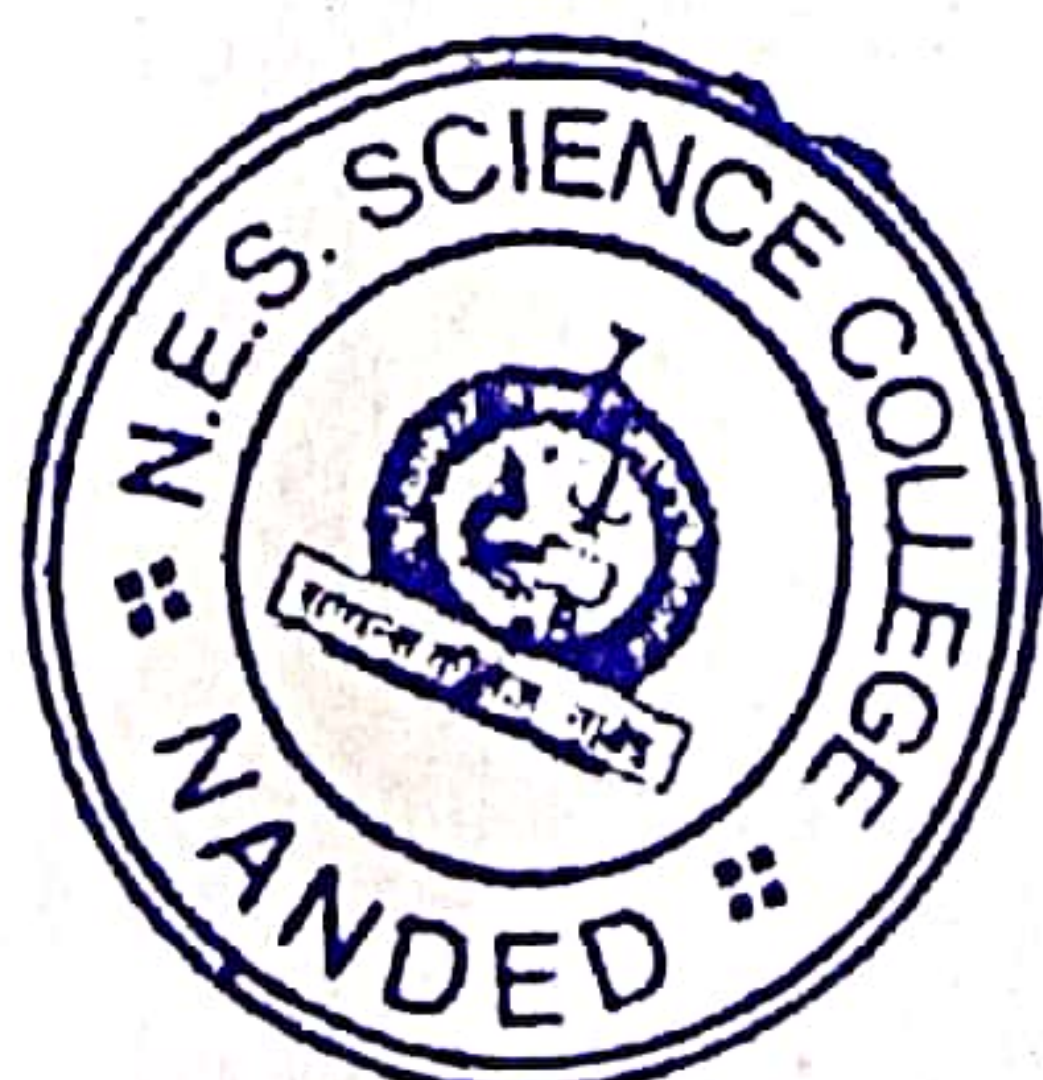

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249	Best Cost Entry Method For The Solution Of Transportation Problem	Dr. D. D. Pawar	Department of Statistics & Computer Science	International Research Fellows Association's Research Journey International E-Research Journal. Vol. 7, Issue 4 Oct-Nov-Dec.2020 pp-79-83	2020-21	E-ISSN: 2348-7143.
250	Some Statistical Properties Of Area Biased Generalized Uniform Distributions	Dr. D. D. Pawar	Department of Statistics & Computer Science	International Journal Of Scientific Research Volume-9 Issue-12 December-2020 pp-40-43	2020-21	ISSN: N0.2277-8179,
251	<i>Reflection of Society and Culture in Indian Literature in English</i>	Dr. Mrs. V. V. Kulkarni	Department of English	Worldwide International Inter Disciplinary Research Journal	2021-22	ISSN:2454-7905 p.234-236, (SJIF Impact factor: 6.91)
252	Data Acquisition through neural sense (MEA) shared via piconet	Dr. V. A. Jadhav	Department of Statistic	International Asian Journal of Mathematics and Computer Science	2018-19	ISSN 2395-4205
253	Prediction of Gold Prices by Using Artificial Neural Network	Dr. D. D. Pawar	Department of Statistic	Bulletin in Mathematics and Statistics	2018-19	ISSN 2348-0580
254	Production and characterization of citric acid by <i>Aspergillus niger</i> using fruit waste	Dr. D. U. Gawai	Department of Botany, Microbiology & Biotechnology	Sanskriti international multidisciplinary research journal	2019-20	International



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255	Production and Optimization of Citric Acid by Aspergillus niger ARUI from Pomegranate Fruit Waste	Dr. D. U. Gawai	Department of Botany, Microbiology & Biotechnology	Journal of Gujrat research society, Vol. 21 No. 13 (2019)	2019-20	International
256	Prakruti Se SakshatkarIbsanke Desh Main – Dr. Vinod Babbar	Dr. Mrs. A. R. Shukla	Department of Hindi	Vidhyawart a volume - 02 , Issue - 30 , Page No.172	2019-20	ISSN No.2319-9318,MAH/MUL/03051/2012
257	Panjab kebalidani Banda BhaddursinhaJivan vratta Evan Balidan	Dr. Mrs. A. R. Shukla	Department of Hindi	Vidhyawart a volume - 02 , Issue - 30 , Page No.172,	2019-20	ISSN No-2319-9318
258	AnuwadkeKshetra main rajgar ki sambhavnaye	Dr. Mrs. A. R. Shukla	Department of Hindi	Printing area volume - 01,Issue – 63Page no.- 135-137volume - 01,Issue – 63	2019-20	ISSN No-2394-5303
259	Holistic approach : Soul of sustainable library services. Pp.5-7	Dr. S. L. Jadhav	Department of Library	IP Indian Journal of Library Science and Information Technology. Vol 3 issue 1 (Jan- June)2019	2019-20	ISSN : 2456 9623
260	Role of library with reading room helps for development of rural area PP. 871-874	Dr. S. L. Jadhav	Department of Library	Arihant Multidisciplinary International Education Research Journal (AMIERJ)V ol VIII Special issue XXIII	2019-20	2278-5655




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261	Transient Thermoelastic Stress Analysis of A Thin Circular Plate Due To Uniform Internal Heat Generation	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Journal of the Korean Society for Industrial and Applied Mathematics, pp.-293-303, Vol-24, Issue-3, Sep 2020	2020-21	Print ISSN: 1226-9433 Online ISSN: 1229-0645
262	Analysis of Transient Thermoelastic Temperature Distribution of a Thin Circular Plate and Its Thermal Deflection under Uniform Heat Generation	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Journal of Thermal Stresses, pp-75-85, Vol.-44 Issue-1, Nov-2020	2020-21	Print ISSN: 0149-5739 Online ISSN: 1521-074X
263	Time Fractional 2D Thermoelastic Problem of Thin Hollow Circular Disk Associated Thermal Stresses	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Bulletin of Marathwada Mathematical Society, pp.-37-47, Vol. 21, Issue. 1 & 2, June & Dec-2020.	2020-21	ISSN: 0976-6049
264	Generalized Theory of Magneto-Thermo-Viscoelastic Spherical Cavity Problem under Fractional Order Derivative: State Space Approach	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Advances in Mathematics: Scientific Journal, pp. 9769-9780, Vol. 9, Issue-11, Dec-2020.	2020-21	ISSN: 1857-8365
265	Time Fractional Thermoelastic Stress Analysis of A thin Rectangular Plate	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	NOVYI MIR Research Journal, Vol. 6, Issue.- 1, pp. 42-56, Jan-2021.	2020-21	ISSN: 0130-7673




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266	Green's Function Approach to Thermal Deflection of a Thin Hollow Circular Disk under Axisymmetric Heat Source	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	Journal of the Korean Society for Industrial and Applied Mathematics, pp. 1-15, Vol. 25, Issue-1, Mar-2021.	2020-21	Print ISSN: 1226-9433
267	Green's Function Approach to Transient Thermoelastic Deformation of a Thin Hollow Circular Disk under Axisymmetric Heat Source	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	JP Journal of Heat and Mass Transfer pp. 133 - 335, Vol. 22, Issue-2, April-2021.	2020-21	Online ISSN: 1229-0645 ISSN: 0973-5763
268	A Detailed Study of a Non-linear Mechanical Oscillator and the Exploration of Chaotic Characteristics	Dr. P. R. Kulkarni	Department of Mathematics & Applied Mathematics	Bulletin of Mathematics and Statistics Research Vol.8.Issue. 4. 2020 (Oct-Dec) PP 69-80	2020-21	ISSN: 2348-0580
269	On Existence of Period Three Orbit and Chaotic Nature of a Family of Mappings	Dr. P. R. Kulkarni	Department of Mathematics & Applied Mathematics	International Journal of Mathematics Trends and Technology Vol. 66, Issue 12, PP-85-90, December 2020	2020-21	ISSN: 2231-5373
270	Some More Properties of One Dimensional Quadratic Family of Mappings	Dr. P. R. Kulkarni	Department of Mathematics & Applied Mathematics	Bulletin of Mathematics and Statistics Research Vol.9.Issue. 2. 2021 (April-June), PP 38-46	2020-21	ISSN: 2348-0580




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271	Well balanced diet plan to boost your immunity	Dr. A. P. Borikar	Department of Sports	Universal Research Analysis Vol . No. V, Issue:XXIII	2021-22	ISSN:2229-4406
272	On Some Special Features of the Henon Mapping	Dr. P. R. Kulkarni	Department of Mathematics	EPRA Intention Journal of Multidisciplinary Research (IJMR)- Peer Reviewed Journal Volume: 7, Issue:10, Oct-21 PP 245-252	2021-22	ISSN(Online):2455-3662
273	An Analysis of a Two Dimensional Continuous Nonlinear Dynamical Systems	Dr. P. R. Kulkarni	Department of Mathematics	International Journal of Scientific Research in Science and Technology(IJSRST)	2021-22	ISSN:Online ISSN :2395-602X Print ISSN :2395-6011
274	Modeling of COVID-19 new cases and death in top 10 affected countries	Dr. D. D. Pawar	Department of Statistics and Computer Science	MGM Journal of medical Sciences VOL.9 Issue -1.January to March 22	2021-22	Impact Factor-3.528 ISSN 2347-7962
275	Effects of weight traing on start skills among competativeswimer s	Dr. A. P. Borikar	Department of Sports	Vision reserch review vol:02 issue:XXIV page No:20-26	2022-23	ISSN:2250-169X



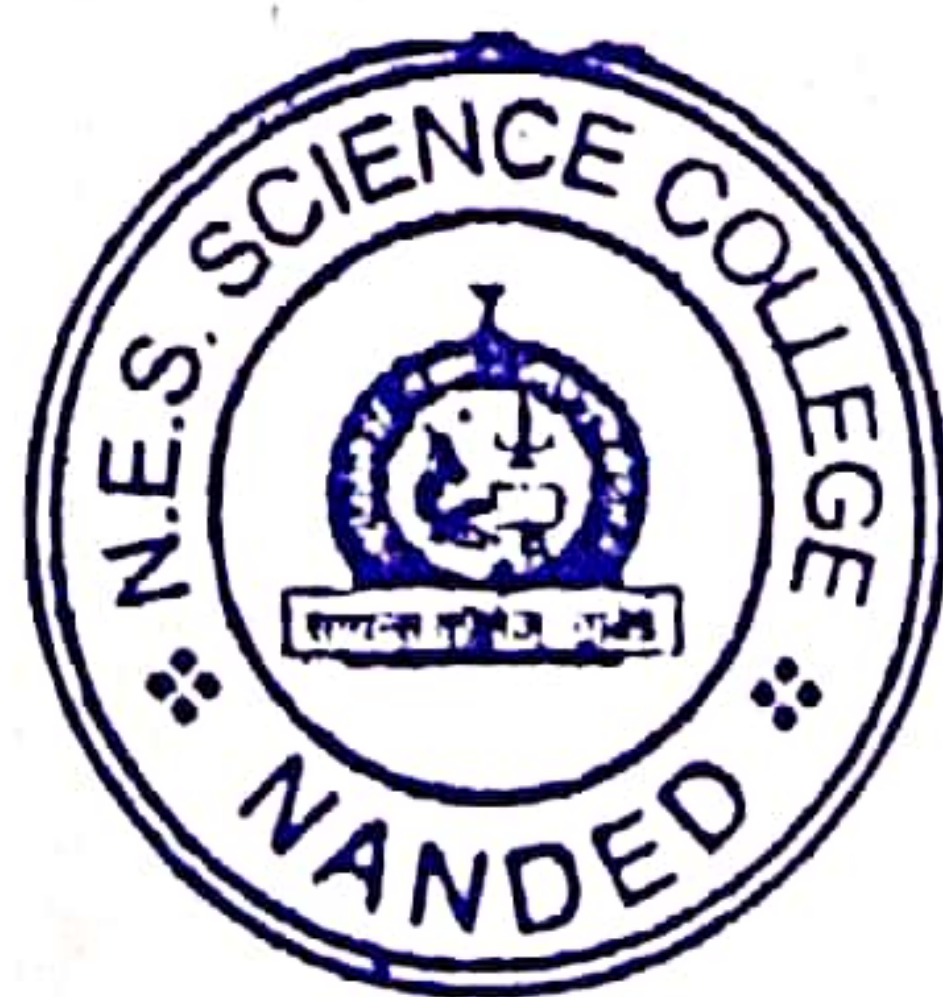

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276	Antarmahavidyalin laghuantardhawana ryaspardhetilsahab hagimahilakheluda nchyaatmavishwas achakridakaryaman awarhonaryaparina machaabhyas	Dr. A. P. Borikar	Department of Sports	Universal Research Analysis issue:XXV VOL:III	2022-23	ISSN: 2229-4406
277	Fractional ordered thermoelastic stress analysis of a thin circular plate under axi-symmetric heat supply	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	international Journal of Nonlinear Analysis and Applications (IJNAA)	2023-24	ISSN: 2008-6822
278	FRACTIONAL ORDER THERMOELASTI C PROBLEM FOR A THIN CIRCULAR PLATE WITH UNIFORM INTERNAL HEAT GENERATION	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	Journal of heat and mass transfer	2023-24	ISSN: 0973-5763
279	A study of the 3- phase lag model to a two-dimensional isotropic micro- polar thermoelastic medium with memory-dependent properties	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	Journal of Thermal Stresses Volu me 47, 2024 - Issue 3	2023-24	ISSN:363-382
280	Memory effects in isotropic semiconductors: a three-phase lag model analysis	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	Mech Time- Depend Mater (2024)	2023-24	https://doi.org/10.1007/s11043-024-09677-5
281	Memory effects in isotropic semiconductors: a three-phase lag model analysis	Dr. K. R. Gaikwad	Department of Mathematics and Applied Mathematics	Mech Time- Depend Mater (2024)	2023-24	https://doi.org/10.1007/s11043-024-09677-5



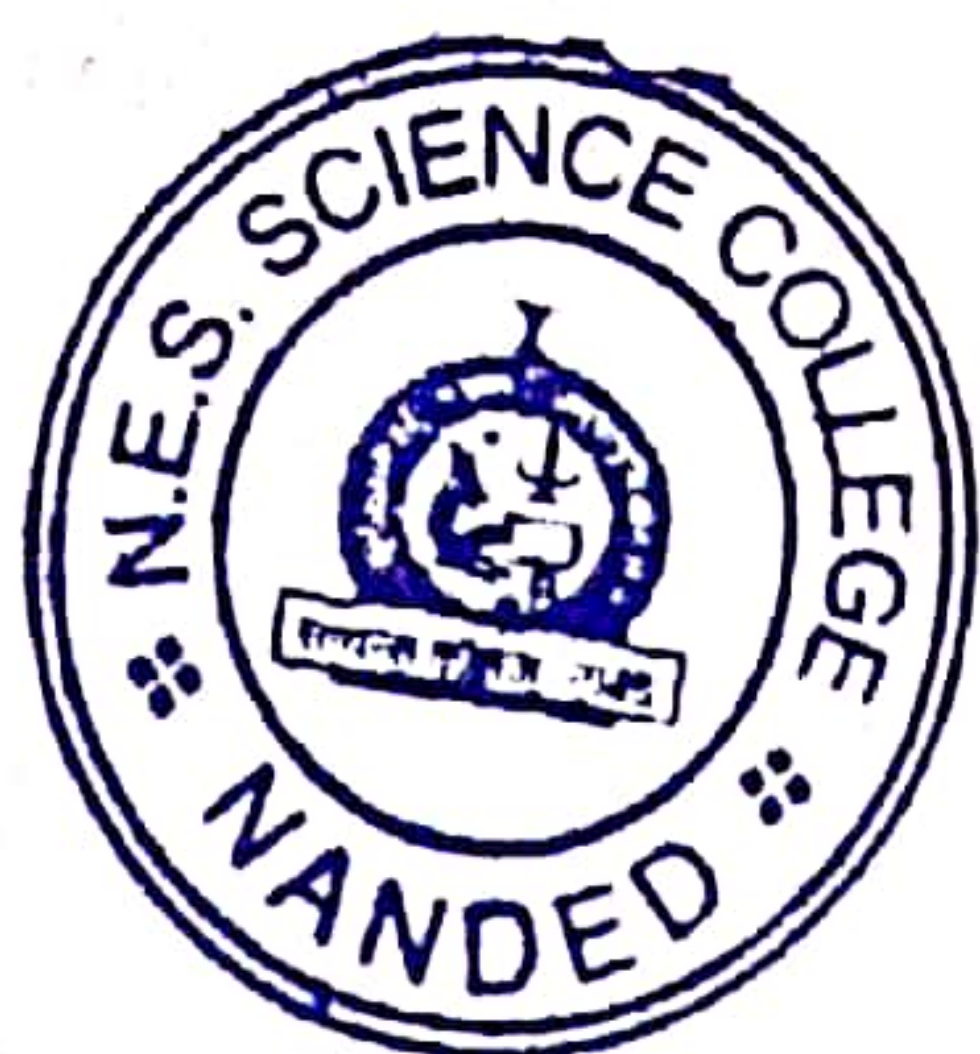
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282	"Higher Educational Institute as a Platform for Start-up"	Dr. Mrs. V. V. Kulkarni	Department of English	International Peer-Reviewed Open Access Journal of Interdisciplinary Studies with ISSN 2581-5828, Page Number - 327-330.	2018-19	Special Issue for 8 th International Symposium and Conference on Growth of Start-up Ecosystem and Innovative Business Incubation: Role of Higher Education Institution of India" organized by Kanoria PG MahilaMahavidyalaya, Jaipur in association with Grand Academic Portal.
283	Study of ponderal index of fish Notopterusnotopterus (Pallas)from Godavari River, At. Nanded	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	International Journal of Scientific Research, Vo 107, Issue-04	2018-19	ISSN-2277,IF-4.7
284	Effect of Pectinase Treatment on physiological parameters of Banana Must and Wine	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	AjantaVol-VIII, ISSUE II-	2018-19	2277-5730



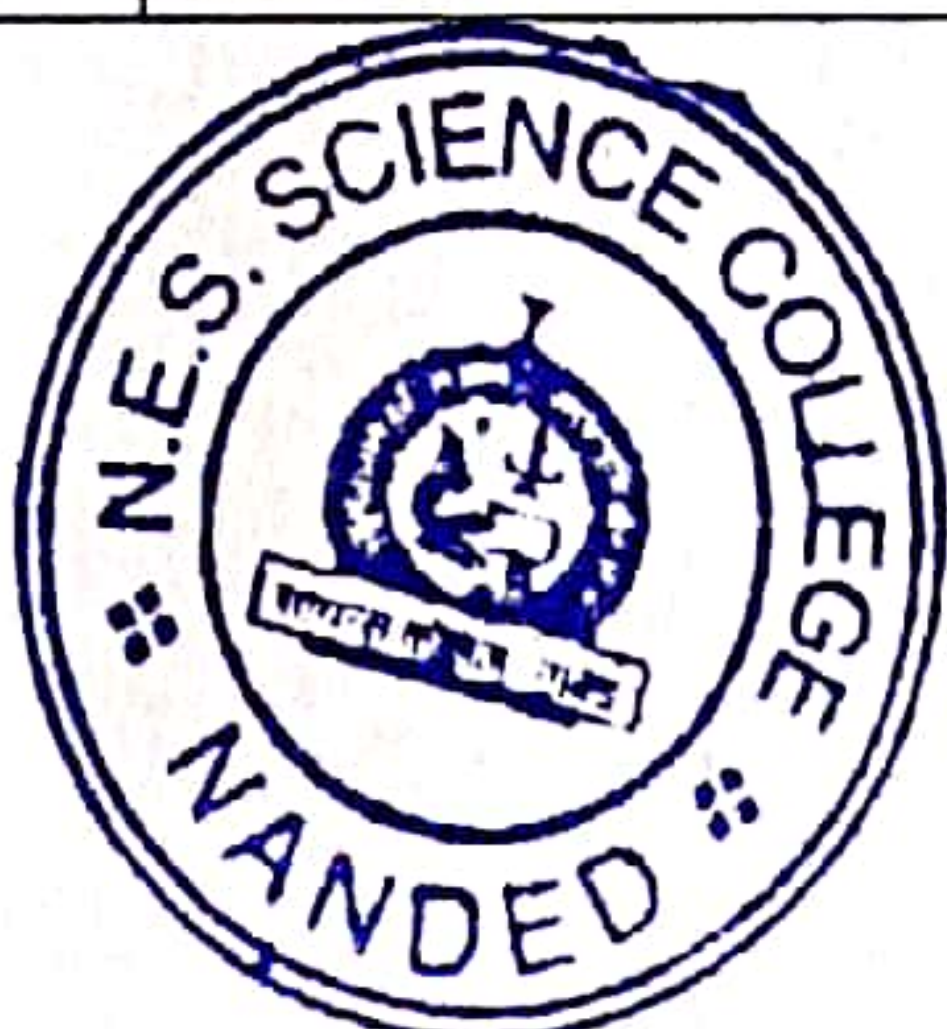

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285	Telephonic Interview with Gurcharan Das	Dr. Mrs. V. V. Kulkarni	Department of English	<i>The Criterion:</i> An International Journal in English (Bi-monthly Galaxy: International Multi-disciplinary Research Journal, Vol.-9, Issue-VI, with page no.-325-328).	2018-19	Peer-reviewed and Indexed e-Journal
286	Toxicological Effects of Heavy Metal Nickel on Carbohydrate Content of Liver Tissue of Fresh Water Fish Tilapia Mossambica (Peters)	Dr. C. S. Bhowate	Department of Zoology	International E-Research Journal, Research Journey, Special Issue 110 (G), PP59-61	2018-19	IF 6.2 ISSN No: 2348-7143
287	Studies on Ponderal Index of RohteeCotio	Dr. C. S. Bhowate	Department of Zoology	International E-Research Journal, Research Journey, Special Issue 110 (G), PP46-48	2018-19	IF 6.2 ISSN No: 2348-7143
288	Toxicity Evaluation of Nickel Nitrate on the Fresh water fish Tilapia Mossambica (Peters)	Dr. C. S. Bhowate	Department of Zoology	International E-Research Journal, Research Journey, Special Issue 110 (G), PP49-53	2018-19	IF 6.2 ISSN No: 2348-7143



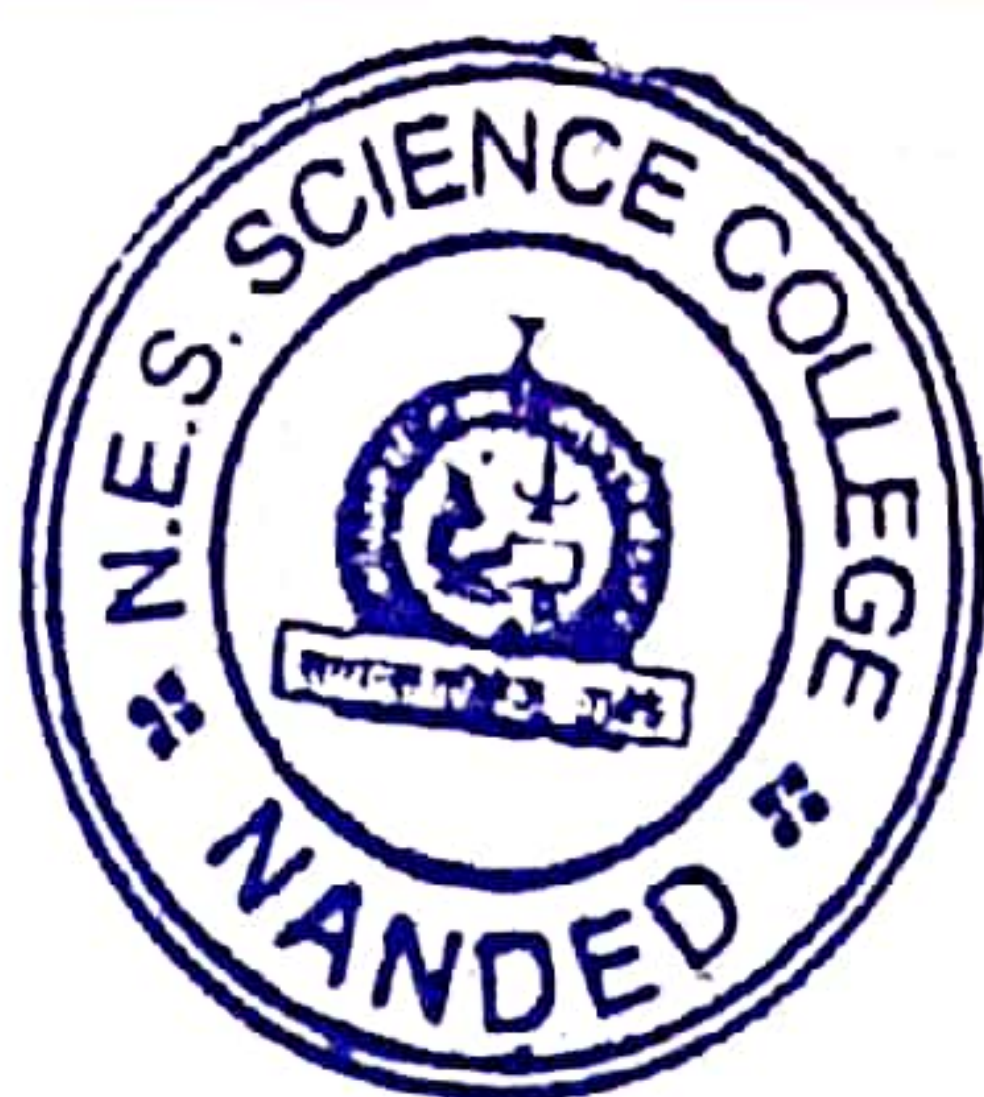

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289	Studies on Protein Content of Labeo Bata	Dr. C. S. Bhowate	Department of Zoology	International E-Research Journal, Research Journey, Special Issue 110 (G), PP 54-55	2018-19	IF 6.2 ISSN No: 2348-7143
290	Effects of Heavy Metal Nickel on Carbohydrate Content of Muscle Tissue of Fresh Water Fish Tilapia Mossambica (Peters)	Dr. C. S. Bhowate	Department of Zoology	International E-Research Journal, Research Journey, Special Issue 110 (G), PP 56-57	2018-19	IF 6.2 ISSN No: 2348-7143
291	Antioxidant properties of silver nanoparticles and methanol extract of <i>Cinnamomum verum</i> bark	Dr. P. S. Borkar	Department of Botany, Microbiology & Biotechnology	International Journal of Creative research thoughts, Vol. 10 (2), pg. 526-534	2021-22	ISSN (E) 2320-2882
292	Cultural Analysis of Sudha Murthy's Dollar Bahu	Dr. Mrs. V. V. Kulkarni	Department of English	LangLit	2020-21	Vol. 7, Issue 3, p.106-9. ISSN2349-
293	Study of fish market in Nanded City, Maharashtra (India)	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.Life Science Research Vol. 7, Issue 1, pp: (435-436),	2018-19	IF-4.7, ISSN 2348-313X (Print) ISSN 2348-3148 (online)
294	<i>Medical Humanities: Pandemic Narratives of Covid-19 Period</i>	Dr. Mrs. V. V. Kulkarni	Department of English	Interlink Research Analysis page-13 to 17, Vol. No. III, Issue: XXV Jan. 2022	2021-22	ISSN 0976-0377 Impact Factor 6.2
295	<i>Use of Symbols in Online Communication</i>	Dr. Mrs. V. V. Kulkarni	Department of English	PUNE RESEARCH: An International Journal in	2021-22	ISSN 2454-3454 Impact Factor 3.02




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				English Vol.8, Issue 1		
296	Studies on moisture and fat content in different organs of Puntius sarana from Godavari river at Nanded Region (M.S)	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.Life Science Research Vol. 7, Issue 1, pp: (359-365)	2018-19	IF-4.7, ISSN 2348-313X (Print) ISSN 2348-3148 (online)
297	Studies on moisture and fat content in different organs of Puntius sarana from Godavari river at Nanded Region (M.S)	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.Life Science Research Vol.7 issue-1,ISSN-2348-3148	2018-19	ISSN-2348-3148 IF-4.7
298	Fuzzy Transportation Problem by using Trapezoidal Fuzzy numbers	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	International Journal of Research and Analytical Reviews Vol.5, Issue 3, pp. 261-265.	2018-19	Cosmos Impact Factor 4.236 e ISSN 2348 -1269, Print ISSN 2349-5138
299	Existence and Approximations to solution of difference initial value problems	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	International Journal of Research and Analytical Reviews, Vol.5, Issue 3, pp. 599-606.	2018-19	Cosmos Impact Factor 4.236 e ISSN 2348 -1269, Print ISSN 2349-5138
300	Variations of protein contents in the muscle of fish Notopterusnotopterus (pallas) from Godavari river at Nanded	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.Science & Engineering, Vol.6,ISSN-2322-0015	2018-19	ISSN-2322-0015,IF-4.7




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301	Online Teaching and Learning Process: Experiences, Felt Problems and Suggestions: A Survey	Dr. Mrs. V. V. Kulkarni	Department of English	Pune Research, An International Peer Reviewed Journal in English, Vol. 7, Issue 2, p.1-5.	2020-21	ISSN 2454-3454
302	Common Fixed Points Theorems for two Mappings in b-Metric Space	Mrs. V. D. Borgaonakar	Department of Mathematics	Mathematics Student, A Journal of Indian Mathematical Society, Volume 90, Issue Nos. 3-4, pp 19 - 27,	2021-22	ISSN: 0025-5742 I.F. 0.03
303	Mathematical Modeling of Non-Homogeneous Steady State Heat Conduction Problem in a Thin Circular Plate with Uniform Heat Source	Dr. K. R. Gaikwad	Department of Mathematics & Applied Mathematics	International Journal of Advance and Innovative Research Vol.-5, Issue -4(XX), Pages, 59-64.	2018-19	
304	Relationship between water, Lipid and Protein in the Muscle, Liver and Gonad in a Freshwater fish, Notopterusnotopterus (Pallas)	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.of Life Science Research Vol.6, Issue 3, pp: (81-82),	2018-19	IF-4.7, ISSN 2348-313X (Print) ISSN 2348-3148 (online)
305	Food and feeding habits of Puntius sarana (Hamilton) from Godavari River, Nanded, Maharashtra state	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.of Life Science Research Vol. 6, Issue 3, pp: (328-330),	2018-19	



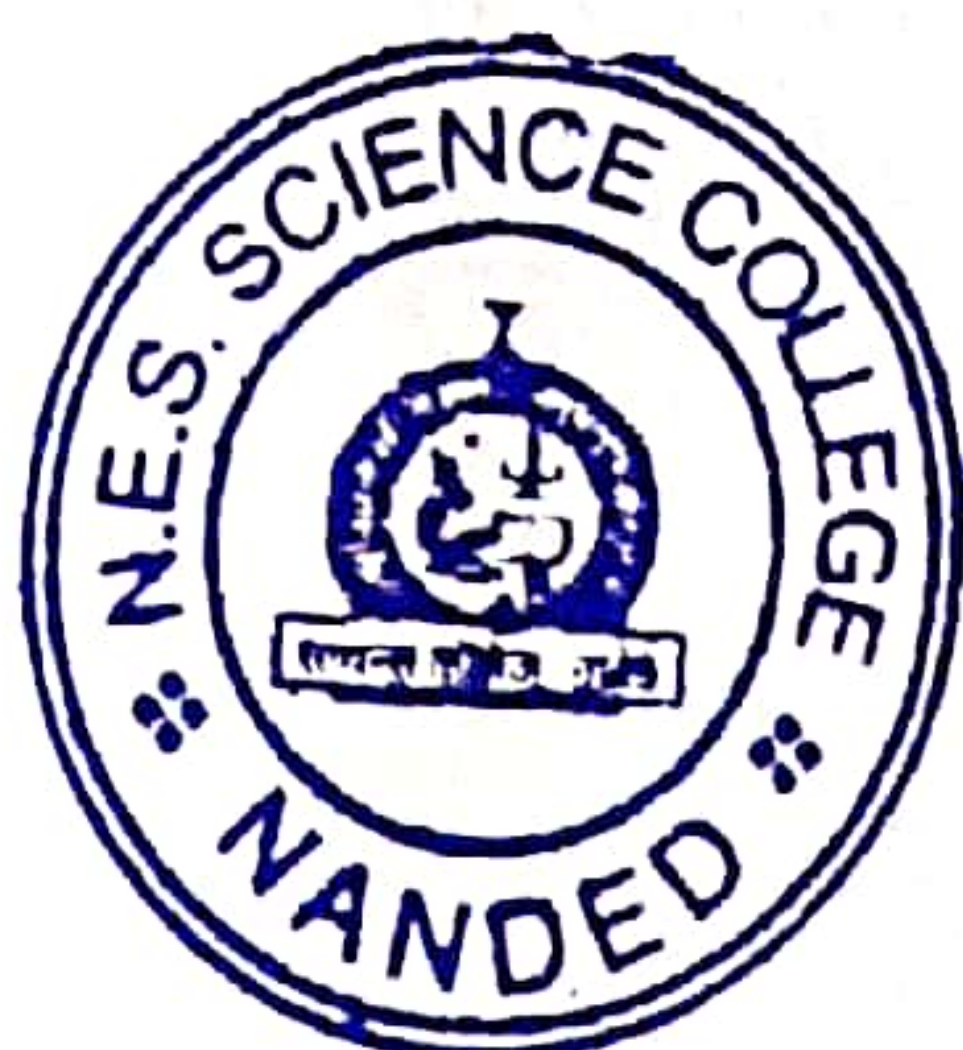

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306	Variation of Protein contents in the muscle of fish <i>Puntius sarana</i> (Hamilton) from Godavari river at Nanded region, Maharashtra	Dr. K. S. Shillewar	Department of Zoology and Fishery Science	Int.J.of Life Science Research Vol. 6, Issue 3, pp: (331-333),	2018-19	
307	Existence of Mild solution for second order summation-difference equations	Dr. K. L. Bondar	Department of Mathematics & Applied Mathematics	IQSR Journal of Engineering, Vol.8, Issue 9, pp. 44-47.	2018-19	2250-3021
308	<i>Acmella radicans</i> (Jacquin) RK Jansen (Asteraceae), an American weed new to Vidarbha region of Maharashtra State (India)	Dr. V B. Chavan	Department of Botany, Microbiology & Biotechnology	Journal of Research & Development 'A' Multidisciplinary International Level Referred and Peer Reviewed Journal, Impact Factor-7.265, , December 2021, Volume-12, Issue-21 R	2021-22	ISSN: 2230-9578
309	Microwave-enhanced heterocyclization: A convenient procedure for 1,5-benzothiazepine using 2-ethoxy ethanol solvent and its antibacterial potential	Dr. A. T. Shinde	Department of Chemistry	Journal of Hetrocyclic Chemistry	2023-24	10.1002/jhet.4823
310	Microwave-enhanced heterocyclization: A convenient procedure for 1,5-benzothiazepine using 2-ethoxy ethanol solvent and its antibacterial potential	Dr. D. M. Jadhav	Department of Botany, Microbiology & Biotechnology	Journal of Hetrocyclic Chemistry	2023-24	10.1002/jhet.4823




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311	Microwave-enhanced heterocyclization: A convenient procedure for 1,5-benzothiazepine using 2-ethoxy ethanol solvent and its antibacterial potential	Dr. P. G. Paul	Department of Botany, Microbiology & Biotechnology	Journal of Hetrocyclic Chemistry	2023-24	10.1002/jhet.4823
312	Watershed level Morphometric Analysis of Kayadhu River, Sub-Basin of Penganga River, Maharashtra India	Sumeet Chavhan, Md, Babar	Department of Geology	International Research Journal of Earth Sciences, Vol. 9, No.5, pp. 1-10	2022-23	2347-7075
313	'Analysis of tilting signatures of the KoradiNadi found in the vicinity of the Penganga River Basin'	Dr. Sumeet Chavhan	Department of Geology	International Journal of Advance and Applied Research	2022-23	Vol.9, No.5, 2022, ISSN 2347-7075.
314	Clustering algorithms and their Applications in cloud computing Environment	Dr. U. S. Patki	Department of Computer Science	International Research Journal of Computer Science (IRJCS) Issue 04, Volume 4 (April 2017) Page -14	2018-19	ISSN: 2393-9842
315	A Literature Review on Text Document Clustering Algorithms used in Text Mining	Dr. U. S. Patki	Department of Computer Science	Journal of Engineering Computers & Applied Sciences(JECAS) Volume 6, No.10, October 2017	2018-19	ISSN No:2319-5606
316	An Experimental Study of Recall and Precision Rates in Retrieval of Text Documents using different distance measures	Dr. U. S. Patki	Department of Computer Science	International Journal of Computer Sciences and Engineering (IJCSE)Volume 5, Issue-12	2018-19	ISSN No. 2347-2693




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317	Fuzzy Document Clustering based on Frequent Features and Feature Length	Dr. U. S. Patki	Department of Computer Science	International Journal of Scientific Research in Computer Science, Engineering and IT, Vol 3 Issue 1	2018-19	Journal No-64718
318	A Study of Role of FOG Computing in IoTs	Dr. U. S. Patki	Department of Computer Science	International Journal of Research and Analytical Reviews (IJRAR)	2018-19	E-ISSN 2348-1269 P-ISSN 2349-5138
319	Internet of Things and Its Applications	Dr. U. S. Patki	Department of Computer Science	International Journal of Research and Analytical Reviews (IJRAR)	2018-19	E-ISSN 2348-1269 P-ISSN 2349-5138
320	A Study of Hard and Soft Document Clustering Techniques	Dr. U. S. Patki	Department of Computer Science	National Conference on Current Advances in Human-Computer InteractionLatur (MS)	2018-19	ISBN 978-93-848110-21-4
321	Applications of Clustering Techniques In the different Research Areas of Applied Sciences	Dr. U. S. Patki	Department of Computer Science	International Conference on Applied Sciences(ICA S-17)Ausa, Dist Latur (MS)	2018-19	
322	A study of Internet of Things (IoT) and IoT Based Smart College Campus	Dr. U. S. Patki	Department of Computer Science	International Conference on IoTs (ICIoT-19)New Arts, Commerce & Science College Ahmadnager (MS)	2018-19	E-ISSN 2348-1269 P-ISSN 2349-5138



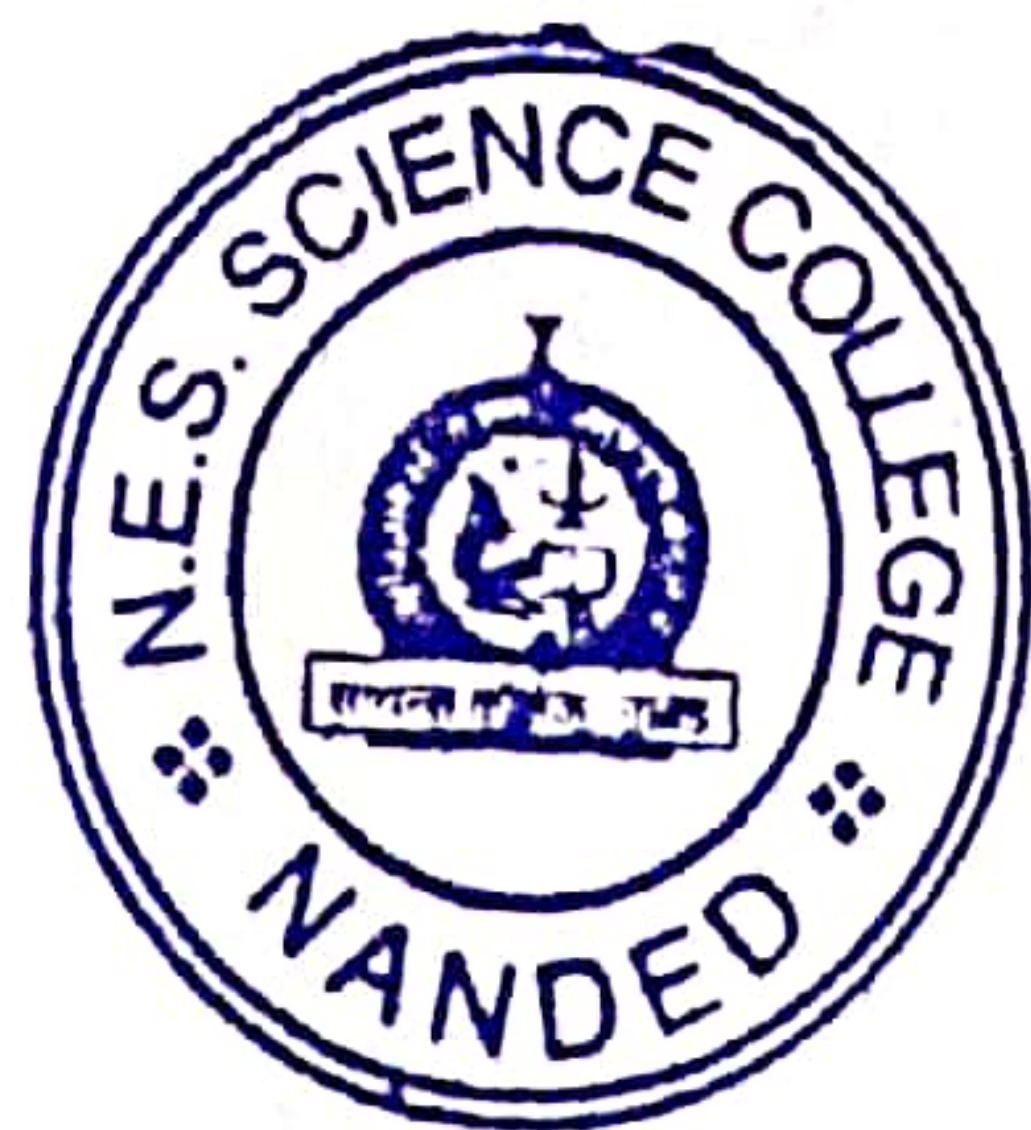

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323	A Review of Text Mining and Information extraction Technology	Dr. U. S. Patki	Department of Computer Science	Emmerging Trends in Computer Science, Communication and Information Technology Yeshwant College Nanded	2018-19	
324	Hand Written Devnagri Numeral Recognition Using Chain Coding Technique	Dr. U. S. Patki	Department of Computer Science	International Conferene on Innovations and Transformations in Knowledge Resources in Electronic Era (ICITKREE-2020) Shivaji College Parbhani	2020-21	
325	Applications Of Clustering Techniques In The Different Research Areas Of Applied Sciences	Dr. U. S. Patki	Department of Computer Science	International Conference on Applied Science (ICAS-17) ShriKusumswamiMahavidyalayaAusaDist Latur	2018-19	
326	Role of Green Computing For Sustainable Future	Dr. U. S. Patki	Department of Computer Science	Parishodh Journal	2019-20	ISSN NUMBER: 2347-6648
327	Applications of Data Mining Techniques on Spatial Data For Site Selection	Dr. U. S. Patki	Department of Computer Science	Parishodh Journal	2019-20	ISSN NUMBER: 2347-6648



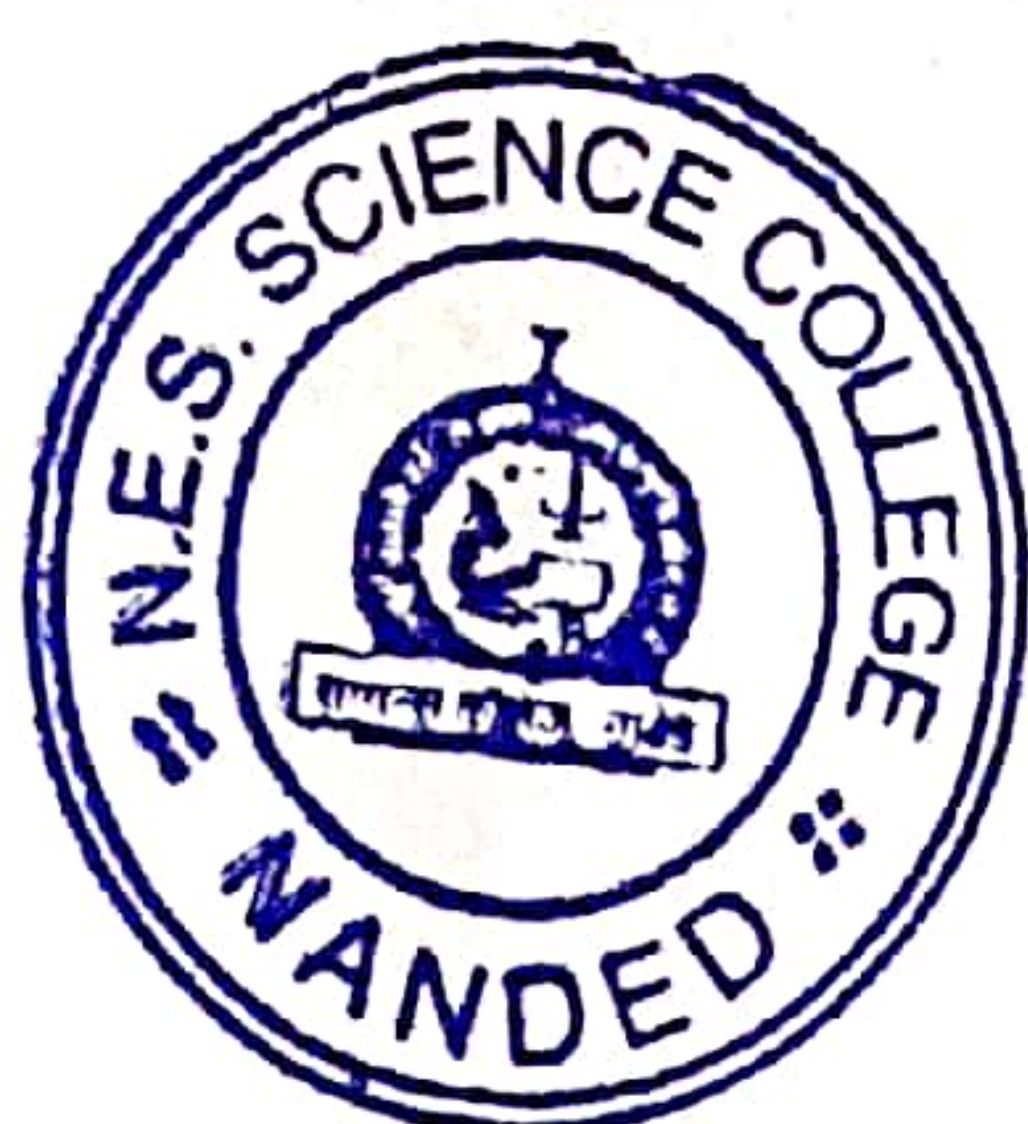

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328	A Study of Internet of Things and IoT Based Smart College Campus	Dr. U. S. Patki	Department of Computer Science	International Conference on IoTs 2019 New Arts Commerce and Science College Ahmadnagar	2019-20	ISSN NUMBER: 2347-6648
329	A Survey of Image Processing and Two Dimensional Image Recognition	Dr. U. S. Patki	Department of Computer Science	AJOMC Asian Journal of Organic & Medicinal Chemistry Vol-7 Number-1 Jan-March 2022 Special Issue-III	2021-22	ISSN: 2465-8937
330	Systematic Review of Dental Biomaterials Based on Dental Radiographs	Dr. U. S. Patki	Department of Computer Science	AJOMC Asian Journal of Organic & Medicinal Chemistry Vol-7 Number-1 Jan-March 2022 Special Issue-III	2021-22	ISSN: 2465-8937
331	Image Segmentation Technique: A Systematic Literature Review	Dr. U. S. Patki	Department of Computer Science	International Journal of Engineering Research and Technology (IJERT)	2022-23	ISSN-2278-0181
332	An efficient, ultrasound induced ring closure of hydroxyl chalcone in ethoxy ethanol as a green reaction medium and study of antimicrobial potential	Dr. Nagesh Deshmukh	Department of Chemistry	Chem. Data Coll., 100606, 31, 2021	2021-22	2405-8300




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333	Microwave induced, efficient, convenient and rapid synthesis of benzyloxy chalcones as potent growth inhibitors.	Dr. Nagesh Deshmukh	Department of Chemistry	Eur. Chem. Bull., 9, 179, 2020	2020-21	2063-5346
334	Synthesis of 2-hydroxynaphthyl pyrazolines containing isoniazid moiety: A potential anti-tubercular agent.	Dr. Nagesh Deshmukh	Department of Chemistry	Letters in Org. Chem., 19, 222, 2022, 2,	2022-22	1875-6255
335	In vitro evaluation of selected Chloro-chalcones for antioxidant activity.	Dr. Nagesh Deshmukh	Department of Chemistry	JETIR, 7, 143, 2019	2019-20	2319-4979
336	Microwave assisted synthesis of some new bis 1,3-benzoxazines and their antimicrobial activity.	Dr. Nagesh Deshmukh	Department of Chemistry	Org. Commun., 13, 2 2020,	2020-21	2349-5162



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337	Synthesis, characterization, spectroscopic studies and biological evaluation of Schiff bases derived from 1-hydroxy-2-acetonaphthanone.	Dr. Nagesh Deshmukh	Department of Chemistry	<i>Heliyon</i> , 5, 2019,	2019-20	1307-6175
338	Epoxidation and antimicrobial activity of Chalcones containing benzyloxy moiety.	Dr. Nagesh Deshmukh	Department of Chemistry	<i>IJGHC</i> , 8, 392, 2019	2019-20	2405-8440
339	Growth Inhibitory Properties of Synthetic Chalcones.	Dr. Nagesh Deshmukh	Department of Chemistry	<i>Current Bioactive compounds</i> , 15, 892, 2019	2019-20	2278-3229
340	A Cleaner and convenient approach to Amines: Reduction of Symmetric diimines using NaBH ₄ ".	Dr. Nagesh Deshmukh	Department of Chemistry	<i>Research Journal of Chemistry and Environment</i> , 23, 76, 2019	2019-20	1875-6646
341	Synthesis of some chloro-substituted isoxazoline derivatives as antibacterial agents.	Dr. Nagesh Deshmukh	Department of Chemistry	<i>Asian Journal of Pharmacy and Pharmacology</i> , 5, 49, 2019,	2019-20	9720626
342	Ultrasound assisted synthesis of chloro-substituted chalcones for their antifungal activity.	Dr. Nagesh Deshmukh	Department of Chemistry	<i>International Journal of Pharmacy and Biological Sciences</i> , 8, 2019	2018-19	2455-2674
343	Nutrient analysis of soil from Nanded district Maharashtra	Dr. Nagesh Deshmukh	Department of Chemistry	<i>IJSR</i> , 11, 1358, 2022,	2022-23	2321-3272



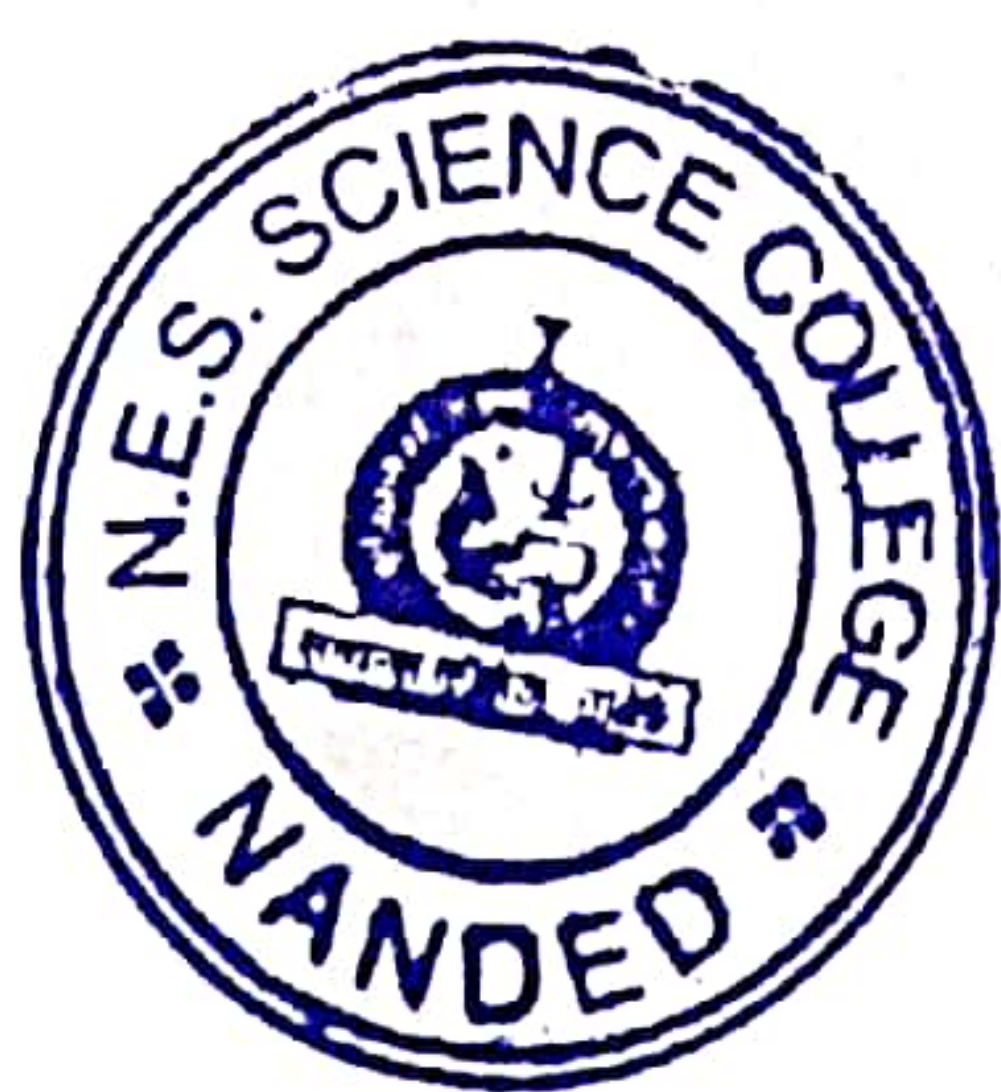

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344	Effect of Bio-fertilizers & Chemical Fertilizers on productivity & quality parameter of wheat: A review	Dr. Nagesh Deshmukh	Department of Chemistry	IJRES, 10, 640, 2022	2022-23	2319-7064
345	Synthesis of some new Schiff bases and their antimicrobial potential	Dr. Nagesh Deshmukh	Department of Chemistry	VIIRJ, 2022	2022-23	2320-9356
346	Synthesis of the substituted 2-Hydroxynaphthyl isooxazoline derivatives as antibacterial agents.	Dr. Nagesh Deshmukh	Department of Chemistry	VIIRJ, 20, 252, 2020	2020-21	2319-4979
347	New flavonols synthesized from 2-hydroxy naphthyl chalcones using 2-ethoxy ethanol solvent as antibacterial agents.	Dr. Nagesh Deshmukh	Department of Chemistry	JETIR, 10, 2023	2023-24	2349-5162
348	Effects of planting methods on growth attributes and yield of paddy (<i>Oryza sativa</i> L.)	Mr. K. K. Jadhav	Department of Chemistry	<i>The Pharma Innovation Journal</i>	2022-23	
349	Plastic Waste Management and Disposal Techniques in Rural Areas of Basmath Tehsil, MS.	Mr. K. K. Jadhav	Department of Chemistry	<i>Int. Res. Journal of Science & Engineering</i>	2022-23	2322-0015



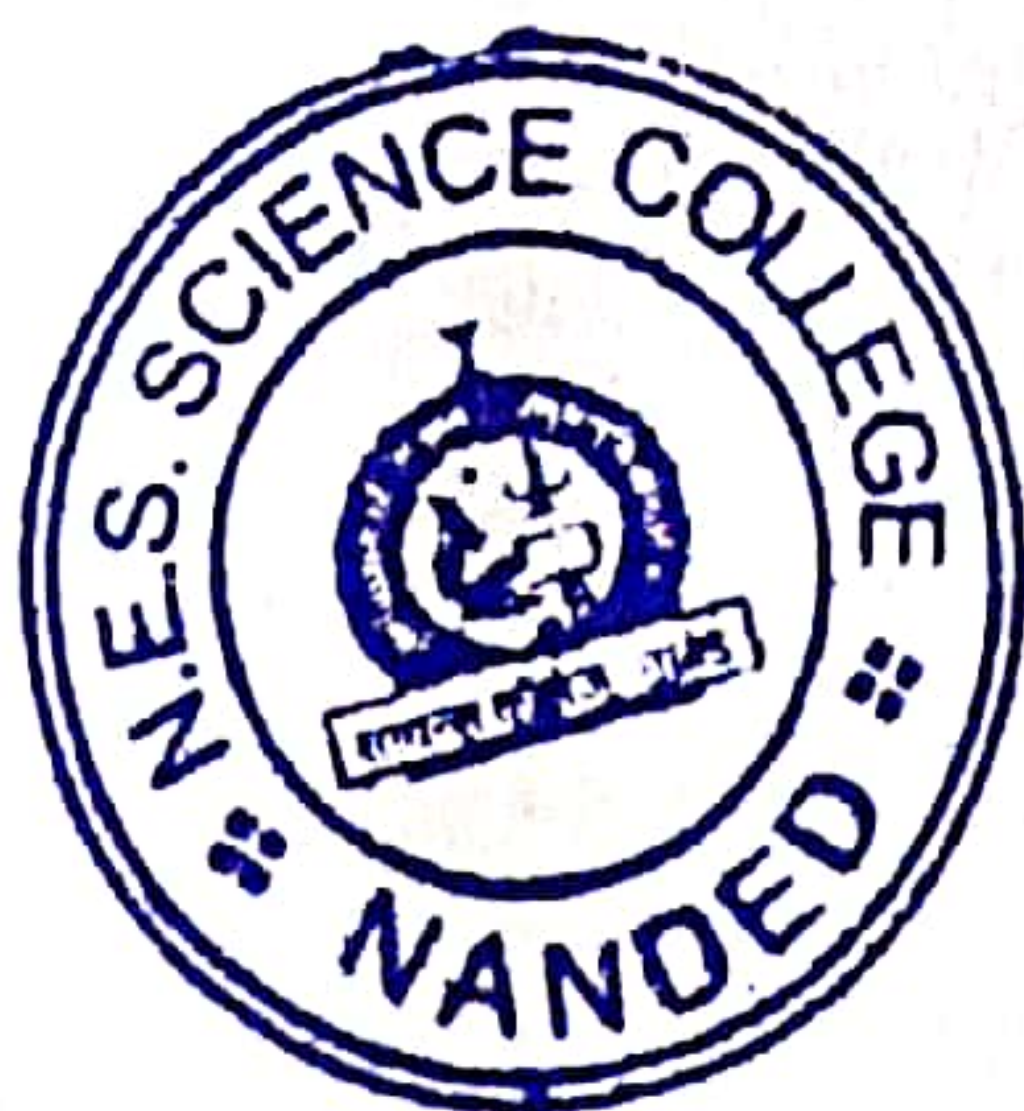

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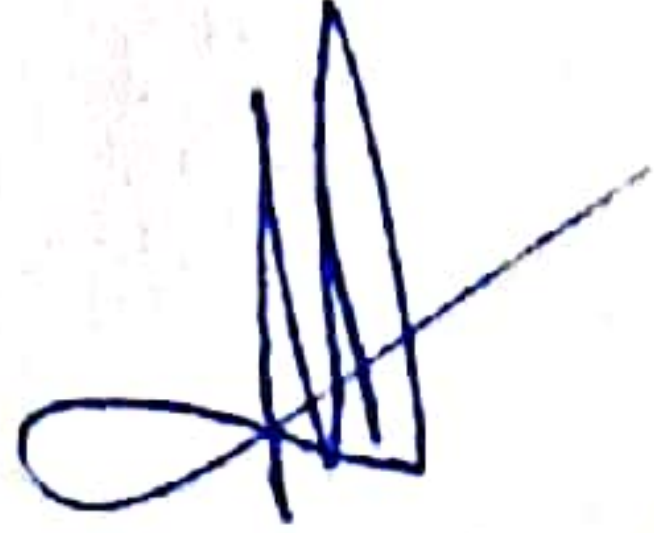
350	Yield and Correlation with Weather Parameters as affected by Transplanting Time and different varieties of Paddy (<i>Oryzasativa L.</i>)	Mr. K. K. Jadhav	Department of Chemistry	<i>Biological Forum –An International Journal</i>	2022-23	0975-1130
351	Physicochemical studies of farmland soil sample in Nanded region of Maharashtra	Mr. K. K. Jadhav	Department of Chemistry	<i>Indian Journal of Agriculture and Allied Sciences Journal</i>	2023-24	2456-4184
352	Status of Micronutrients in soils of Nanded district, maharashtra, india	Mr. K. K. Jadhav	Department of Chemistry	<i>Indian Journal of Agriculture and Allied Sciences Journal</i>	2023-24	2456-4184
353	Effects of Planting Methods onYield Attributes and Yield of Paddy (<i>Oryza sativaL.</i>)	Mr. K. K. Jadhav	Department of Chemistry	IJNRD	2023-24	2395-1109
354	Multimodal Web Content Mining to Filter Non-learning Sites Using NLP	Dr. Mrs. Sangita Modi	Department of Computer Science	<i>Springer Nature Switzerland AG 2020</i>	2020-21	doi.org/10.1007/978-3-030-24643-3_3
355	Web Content Filtration Using Different Web Mining Techniques in Educational System: An Overview	Dr. Mrs. Sangita Modi	Department of Computer Science	International Journal of Advanced Research in Computer Science and Software Engineering	2018-19	ISSN: 2277 128X



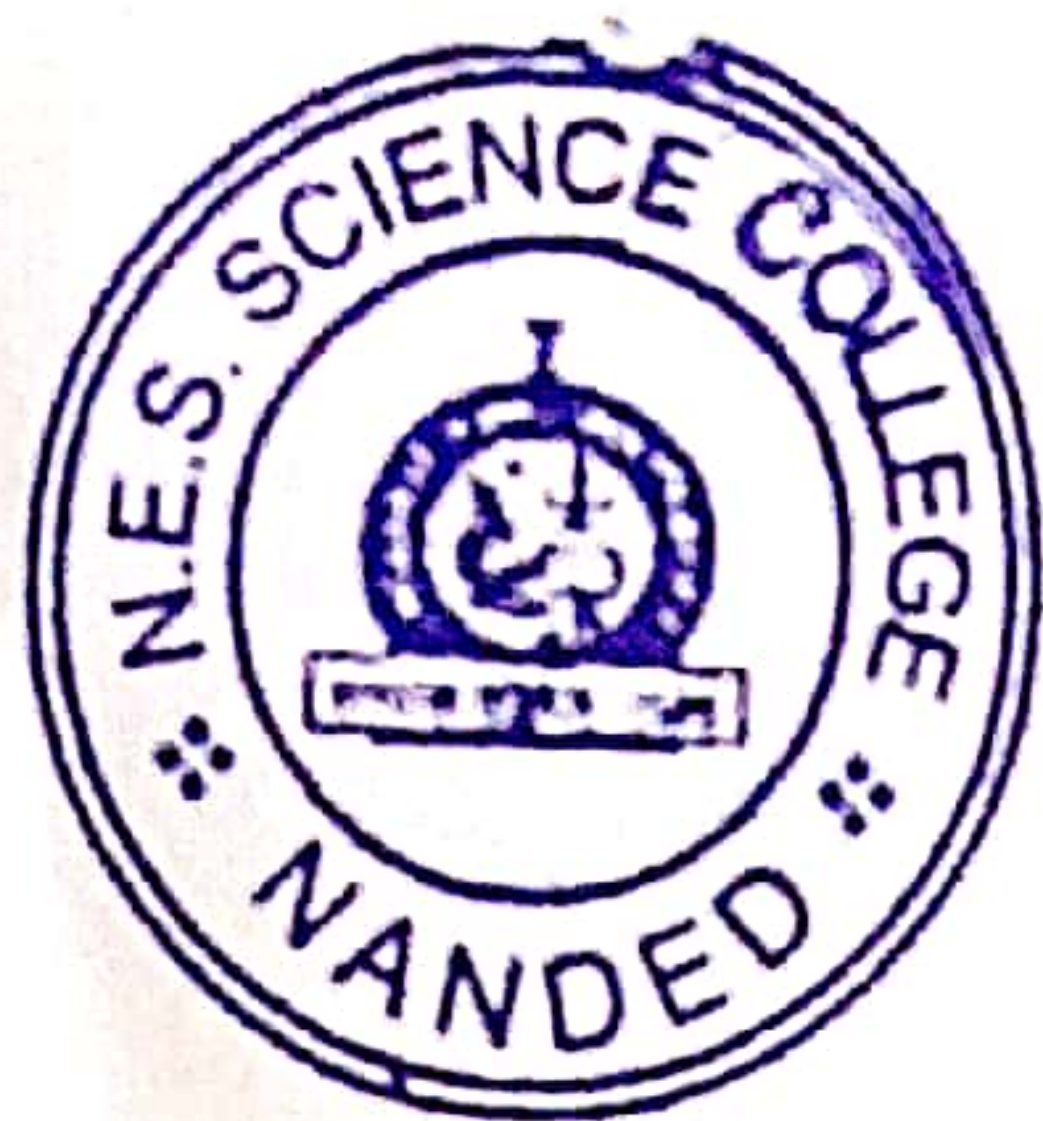

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356	A Role of Semantic Web and Ontology in Information Retrieval	Dr. Mrs. Sangita Modi	Department of Computer Science	INTERNATIONAL RESEARCH JOURNAL OF MULTIDISCIPLINARY STUDIES SPECIAL ISSUE ON ADVANCEMENT IN FIELD OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY	2018-19	2454-8499
357	Browser Integrated Web Content Filtering Using Natural Language Processing	Dr. Mrs. Sangita Modi	Department of Computer Science	International Journal of Modern Electronics and Communication Engineering (IJMECE)	2018-19	2321-2152
358	A Keyword Based Educational and Non-Educational Website Recognition Tool	Dr. Mrs. Sangita Modi	Department of Computer Science	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	2018-19	2278-3075
359	Keyword Based Web Filtering Tool For E-Learning Sites	Dr. Mrs. Sangita Modi	Department of Computer Science	International Journal of Computer Sciences and Engineering	2018-19	2347-2693




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360	Development of High-Performance Supercapacitor using Faceted ZIF-67 MOF Synthesized by Facile Chemical Route	Dr. V. N. Narwade	Department of physics	AIP Conf. Proc. 3170, 040006 (2024)	2024	https://doi.org/10.1063/5.0216458
361	In-detailed investigation of Fe ₃ O ₄ powder derived from waste toner material for supercapacitor electrode application	Dr. V. N. Narwade	Department of physics	AIP Conf. Proc. 3170, 040006 (2024)	2024	https://doi.org/10.1063/5.0216458
362	Investigation of possible effects of electrolyte molarity on Ni-based MOF as an electrode material for highly efficient supercapacitors	Dr. V. N. Narwade	Department of physics	AIP Conf. Proc. 3170, 040006 (2024)	2024	https://doi.org/10.1063/5.0216458
363	Wild Edible Plants as a Nutrition-Medicine Continuum An Ethnobotanical Survey of Gawali Tribe in Nanded District (Maharashtra) India	Dr. V. R. Marathe	Department of Botany, Microbiology & Biotechnology	Indian forester	2024	0019-4816




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EFFECT OF TEMPERATURE AND pH ON PECTIN LYASE ACTIVITY PRODUCED BY *PENICILLIUM DIGITATUM* ON ORANGE PEELS

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ABSTRACT

Pectinolytic enzymes are one of the several extracellular enzymes produced by fungi that break down pectin. Pectin lyase extensively used in the clarification of fruit juices and wines. Currently, they are widely used in industry for retting of natural fibers and extraction of oils from vegetable and citrus peels. In the present study utilization of orange peels as an agro industrial waste for production of pectin lyase (PL) [E.C.4.2.2.10] by *Penicillium digitatum*, *Carvularia lanata* and *Aspergillus niger* was investigated using solid state culture (SSC). The highest level of extracellular pectin lyase was detected with this waste as an inducing substrate. The optimum pectin lyase activity was at pH 4.52-5 and 6.5 in case of *Aspergillus digitatus* and *Carvularia lanata* respectively. The highest PL activity for all the three fungi was recorded at temperature 40 °C and incubation time 48-50 minutes.

KEYWORDS: Pectin lyase, Orange peels, *Penicillium digitatum*, *Carvularia lanata* and *Aspergillus niger*.

INTRODUCTION

Pectinases are group of enzymes that attack pectin and depolymerise it by hydrolysis and transamination as well as by deesterification reactions, which hydrolyses the ester bond between carboxyl and methyl groups of pectin (Ceci and Lorzano, 1998). These enzymes act on pectin, a class of complex polysaccharides found in the cell wall of higher plants and cementing material for the cellulose network. Siemere and Said (1989) stated that pectin in its pure state has different characteristics from pectin extracted from the crude orange peel. Friedrich et al. (1989) showed that comparison of pectinases produced by different fungi is not easy because different culture conditions and different methods for enzyme activity have been used. Pectinases account for 10% of the global industrial enzymes produced (Stutzenberger, 1992). The enzymes that hydrolyse pectic substances are broadly known as pectinolytic enzymes or pectinases, which include polygalacturonase, pectin esterase, pectin lyase and pectate lyase on the basis of their mode of action (Alkorta et al., 1998). Pectinolytic enzymes of fungal origin attract the most attention since they offer tremendous potential to the industry. Pectinases have widespread applications in retting of flax and vegetable fibres, de-pectinisation and clarification of fruit juices, extraction of oils from vegetables and citrus peels, manufacturing of paper and pulp and pre-treatment of pectic wastewater (Saito et al., 2004). Pectin degradation plays an important role in plant diseases (Bateman and Millet, 1966; Ishii, 1976; Talboys, 1984; Collmer and Keen, 1986; Durrans and Cooper, 1988; Chen et al.,

1998; Omar and Abd-Alla, 2000). Pectin methyl esterase [E.C.3.1.1.11] and pectin lyase [E.C.4.2.2.10] (Wang and Keen, 1970). Pectin lyase [poly (methoxygalacturonide) lyase, PMGL, PNL or PL; E.C.4.2.2.10] seems to be the only pectic enzyme capable of breaking down pectin with high degree of esterification (like those found in fruits) into smaller molecules (Wijesundera et al., 1984; Alana et al., 1990; Serra et al., 1992). The production of extracellular pectinases is induced by agroindustrial wastes such as lemon or orange peels which contain appreciable quantities of pectin (Aguilar and Huitron, 1986; Maldonado, et al., 1986; Fonseca and Said, 1994; Grohmann et al., 1994; Alkorta et al., 1998; Castillo et al., 1999; Marias et al., 2002). High levels of pectinases were produced by *Talaromyces flavus*, *Tabernaularia vulgaris* and *Penicillium chrysium* in solid state fermentation using citrus pulp pellets (Siemere and Said, 1989). In previous studies, we have shown that *Carvularia lanata* NRRL 13894 is capable of producing pectin methyl esterase in solid state culture using orange peels as an inducer. In the present study, the effect of temp. and pH on pectin lyase from *P. digitatum*, *C. lanata* and *A. niger* using orange peels was determined.

MATERIALS AND METHODS

Preparation of enzyme

Penicillium digitatum, *Carvularia lanata* and *Aspergillus niger* were isolated from peels of orange on Martin Rose Bengal Streptomycin agar medium. Pectin lyase (PL) was produced from these fungi using solid state



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Research Article

Effect of Temperature and pH on growth of *Alternaria alternata*, leaf spot pathogen of soyabean

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Keywords:Soyabean, *Alternaria alternata*, Temperature, pH.**Abstract**

Soyabean is widely cultivated oil seed crop in Marathwada and rest of Maharashtra region. The leaf spot of soyabean is caused by *Alternaria alternata* is becoming a common disease on soyabean crop. The fungal pathogen are greatly influenced by environmental factor therefore the present work undertaken to study the effect of temperature and pH on growth of *Alternaria alternata*. The effect of temperature and pH were determined by colony diameter method by using Martins rose Bengal streptomycin agar medium. It is clearly evident from the result that all the temperature pH tested showed variation in the diameter of colony. The temperature 35°C encouraged better growth of *Alternaria alternata* as compared to 30°C and 40°C. The result also revealed that pH 6.5 encouraged better growth of *Alternaria alternata* to the pH 7.5 and 5.5. It is concluded from the result that temperature 35°C and pH 6.5 is optimum temperature and pH for the growth *Alternaria alternata*.

INTRODUCTION

In India soyabean (*Glycine max* (L) Merrill) has been no.1 oil seed crop in terms of both area and production since 2005. It has shown unparallel growth over the last four decades from an area of only 30000 ha and production of 14000 ton in 1970, the area reached 9.95 million ha with total production of 12.57 million ton in 2011, with an average National yield of 1264 kg/ha. Soyabean occupied 42% of India's total oil seed and 25% of edible oil production. The feasibility of growing soyabean crop with minimum input / management lead to the rapid expansion in area production with the result that India now rank 4th in term and global soyabean area sown and 5th in term of soyabean production. In India soyabean is mainly grown in the state of Madhyapradesh, Maharashtra, Rajasthan, Karnataka, Telangana, Chhattisgarh, Nagaland and Gujrat as a rain fed crop during the rainy (kharif) season. The crop has potential of

mitigating rampant protein energy malnutrition as well as becoming ideal food of the country and account of a number of nutraceutical and functional compound. Currently soyabean is severely attacked about half a dozen major diseases, a dozen insect pest and several major weeds. Yield loss due to individual diseases, insect, weeds species ranges from 22 to 100% (Sharma, 2014).

The phyllosphere of plants is a dynamic ecosystem inhabited by specific bacteria, yeasts and fungi. Their activity is related to various interactions between the biotic and abiotic factors of the environment (Thakur and Harsh, 2014). Abiotic factors includes Temperature, pH, Humidity, Light intensity etc. whereas biotic factors include pest and other microorganisms, these microorganisms will compete with pathogenic species this phenomenon called antagonistic activity and it has been studied by many researcher (Kumar, 2008; Panwar *et al.*, 2013).

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EVALUATION OF SOME BIOCHEMICAL CHANGES IN SOYABEAN CROP
INFECTED WITH LEAF SPOT DISEASE

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ABSTRACT

Leaf spot is most common infectious disease recorded on soybean crop (*Glycine max* L. Merrill.) causing more than 30 per cent yield losses. Present study was carried out to evaluate the changes occurring in biochemical's viz., total sugar, reducing sugar, non-reducing sugar, protein and fat in healthy as well as infected foliage of soybean crop. Results showed that in diseased foliage total sugar content was reduced drastically over healthy one, reducing sugar and non-reducing sugar contents were higher in healthy leaves (22.5% and 12.5 % respectively) than infected (8.5% and 7.3 %, respectively). Crude protein were higher (18.8%) in healthy leaves than infected (13.8%), from this work it is evident that the infection of Leaf spot disease causes drastic alterations in amounts of biochemical's in soybean crop.

KEYWORDS: Biochemicals, Crude protein, *Glycine max*, non-reducing sugar.

INTRODUCTION

Soybean belongs to legume plant it has received a great attention all over the world as an important source of nutrition. The protein derived from soybean is comparatively cheaper than the animal source of protein (Kaul and Das, 1986). Soybean plant fixes atmospheric nitrogen as a result crop is less dependent on nitrogen chemical fertilizer (Hoque, 1978). Most of the people in India consume soybean oil in their daily food dishes. A large number of soya products are successfully developed. Soyproducts such as soyaflour, soya milk, soya bread, soya biscuits etc. are commercially produced in India.

All part of soybean plants are susceptible to disease more than hundred pathogens are known to affect soybean of which 35 are economically important diseases (Sinclair and Backman, 1989). Soybean disease reduce yield on an average 10 to 30 % (Sinclair, 1994). In India soybean suffer from many diseases among them leaf spot disease is an important disease that reduce yield of crop. Leaf spot disease is caused by various fungal pathogen viz., *Cercospora* spp., *Alternaria* spp., *Septoria* spp. etc.

The common biochemical constituents like chlorophyll, sugar, protein and fats are important in imparting resistance to crop plant but almost all living plant show biochemical changes after infected by infectious agents (Bora and Joshi, 2013). Biochemical changes like

infection reported by many workers in different plant by different plant pathogens (Bashan, 1986, Gupta et al., 1980, and Waghmare et al., 2012) but there is little information seems to be available for biochemical changes in soybean crop due to leaf spot disease.

Hence present investigation was carried with the objective to study the different biochemical changes in foliage of soybean infected with leaf spot disease.

MATERIALS AND METHODS

For the quantitative estimation of primary metabolites different protocols were used. Leaves of the healthy and infected plant were collected, washed with distilled water, shade dried and powdered. The powder was used for analysis of total sugar, Reducing and non reducing sugar, protein and fat of the soybean plants.

Estimation of total sugar: This was done by the Anthrone standard method (Sadasivam and Manikam, 2008). A standard curve was obtained using the following concentration of glucose in (mg/ml). 0.00, 0.20, 0.40, 0.60, 0.80 and 1.00. 0.5 and 1ml aliquots of each healthy and infected sample solution was measured into test-tube and 4ml anthrone solution added. This was heated for 8 minutes in boiling water bath. It was then allowed to cool. The absorbance was then read off a spectrophotometer at 630nm. The sugar concentration was then obtained by plotting standard curve.



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IN VITRO EVALUATION OF SOME PLANT EXTRACTS AGAINST *ALTERNARIA ALTERNATA* CAUSING LEAF SPOT OF SOYABEAN

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ABSTRACT

In vitro antifungal activity of aqueous extract of four different plant species viz. *Ocimum sanctum*, *Datura stramonium*, *Xanthanum stramonium* and *Cassia tora* were tested against plant pathogenic fungus *Alternaria alternata*. This fungus causes Leaf spot disease in soyabean crop. The plant extracts were taken in five different concentrations (5%, 10%, 15%, 20%, 25%) and evaluated the radial growth of mycelia. All plant extracts showed good antifungal properties. Among four plant species *Datura stramonium* at 25% concentration show maximum percentage of inhibition (56%) and it is followed by *Ocimum sanctum* (50%), *Cassia tora* (36%), *Xanthanum stramonium* (25%).

KEYWORDS: *Alternaria alternata*, Antifungal activity, Leaf spot.

INTRODUCTION

Soyabean (*Glycine max* L.Merr) has received important position among protein sources. Most of Indian people consume soyabean oil in their daily dishes due to its high quality. A large number of soya products are successfully developed (Shovan et. al. 2008).

All parts of soyabean plant are susceptible to disease, more than hundred pathogens are known to affect soyabean, of which thirty five are of economically important (Sinclair and Backman, 1989). Many pathogen including *Fusarium oxysporum*, *Rhizoctonia solani* and *Alternaria alternata* are causing severe damage to agricultural crops (Hadizadeh et. al. 2009). *Alternaria alternata* an important fungal pathogen which mostly cause disease on aerial part of many plants worldwide (Rotem, 1998). It causes Leaf spot disease on soyabean crop. Recently in different parts of the world attention has been paid towards exploitation of higher plant products as novel chemo therapeutics in crop protection (Singh and Shrivastava, 2013). To control the use chemical pesticides more emphasis should be done on identification of beneficial natural biopesticides hence Plants can be a good source of biopesticides. They are comparatively less toxic and ecofriendly (Aslam et al 2010).

Therefore the present study aims to find the cost effective and eco-friendly bio-compound for management of leaf spot of soyabean using aqueous extract of four different plant species.

sanctum, *Datura stramonium*, *Xanthanum stramonium* and *Cassia tora* were tested against plant pathogenic fungus *Alternaria alternata*.

MATERIALS AND METHODS

1. Isolation of pathogen

The fungal strain *Alternaria alternata* were originally isolated from naturally diseased soyabean plant collected from agricultural field of Dharmabad region. The fungus was cultured on Martin rose Bengal streptomycin agar plate and incubated at 28±2°C for one week. Purification of resulting isolates was done using the hyphal tip technique and single spore technique to obtain the pure culture. Detected isolates were then transferred into slants of Martin rose Bengal streptomycin agar and kept at 4°C for further studies. It is then identified with microscopically examination (Ruksana et al 2010).

2. Preparation of plant extract

The selected plants were collected from Dharmabad region and washed thoroughly with tap water and air dried. 10 gm of fresh plant leaves were grind using mortar and pestle adding equal amount of sterilized distilled water(1:1, W/V).

3. Antifungal activity of plant extract

The effect of plant extract taken into study against the mycelia growth of *Alternaria alternata* was tested by poisoned food technique (Dhingra and Sinclair 1985). An appropriate quantity of each extract was incorporated in sterilised martin rose Bengal streptomycin agar to



EFFECT OF CHLOROTHALONYL AND MANCOZEB ON GROWTH OF *AUREOBASIDIUM PULLULANS* (DE BARY) G. ARNAUD.

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ABSTRACT

Aureobasidium pullulans (De Bary) G. Arnoud is a ubiquitous, polymorphic and oligotrophic black yeast-like phylloplane microfungus that occurs frequently in wide range of tropical and temperate environments. This fungus is agronomically important because it protects leaf surfaces from the infection of other pathogenic fungi; therefore it is considered as ecofriendly phylloplane yeast. In the present investigation in order to know the effect of fungicides on the growth of this beneficial fungus, two fungicides namely chlorothalonyl and mancozeb were tested against four isolates of *Aureobasidium pullulans* which were isolated from phylloplane surfaces. Among isolate no III and IV were found to be more sensitive to chlorothalonyl as compared to I and II. Similarly isolate no IV were found to be more susceptible to mancozeb followed by isolate III, II and I. The MIC value of chlorothalonyl for the isolate III and IV were found to be 160 ppm followed by 360 ppm for isolate no I and II. The MIC values of mancozeb for isolate no IV were reported to be 120 ppm followed by 160 ppm for III and 400 ppm for isolate I and II.

Key Words: *Aureobasidium pullulans*, Chlorothalonyl, Mancozeb.




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SCREENING OF CELLULASE PRODUCING FUNGI ISOLATED FROM TOMATO FRUITS

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ABSTRACT

Cellulolytic enzymes are synthesized by a number of microorganisms. Fungi and bacteria are the main natural agents of cellulose degradation. The cellulose utilizing population includes bacteria, filamentous fungi, actinomycetes and certain protozoa. However, fungi are well known agents of decomposition of organic matter, in general, and of cellulosic substrate in particular. In the present investigations the fungi were isolated from infected fruits of tomato by using Martins rose bengal streptomycin agar. Total 10 fungi were isolated from the infected fruits. All the fungi showed more or less cellulase enzyme activity however out of 10 fungi 04 fungi showed maximum enzyme activity. It is concluded from the results that *Aspergillus niger* and *Fusarium moniliforme* are the good producers of cellulases *in vitro*.

KEYWORDS: Tomato fruit, Cellulases, fungi, clearance zone.

INTRODUCTION

Cellulose, a polymer of β -D-glucopyranose with 1,4 β -glycosidic bonds, is the most abundant component of plant biomass. It is found in nature almost exclusively in plant cell walls, although it is produced by some animals e.g., tunicates and few bacteria (Lynd *et al.*, 2002). Perpetual renewal of plant biomass via the process of photosynthesis ensures an inexhaustible supply of such material. Any process which could efficiently and economically convert cellulosic material to glucose would be of immense industrial significance (Walsh, 2002). Cellulose is totally insoluble in water (Ledberg, 1992). It is a linear, unbranched homopolysaccharide consisting of glucose subunit joined together via β -1,4 glycosidic linkages. Individual cellulose molecules (polymer) vary widely in length and are usually arranged in bundles or fibrils (Walsh, 2002). Within the bundles, cellulose molecules can occur in crystalline or paracrystalline (amorphous) structures (Walter, 1998).

Cellulases are the hydrolytic enzymes which are responsible for the decomposition of the natural cellulose polymer by acting at 1,4 β -D-glycosidic linkages thus finally converting into glucose monomer. Cellulases are composed of three major components, endo β -glucanase (EC.3.2.1.4), exo β -glucanase (EC.3.2.1.91) and β -glucosidase (EC.3.2.1.21). These enzymes act together synergistically and cooperatively to convert native crystalline cellulose to oligosaccharides and glucose. Endo β -glucanase (1,4 β -D-glucohydrolase or CMCase) attacks randomly on internal glycosidic bonds of

cellulose chain resulting in a rapid scission to yield oligosaccharides and glucose (Wood 1985). Exo β -glucanase (1,4 β -D-glucoanocellobiohydrolase or cellobiohydrolase) hydrolyzes highly crystalline cellulose attaching on newly generated ends (Hoshino 1997). The enzyme β -glucosidase hydrolyzes the aryl- and alkyl-glucoside as well as cellobiose and cello-dextrin to glucose (Kubiack, 1994).

The initial step in cellulose destruction is the enzymatic hydrolysis of polymers. The enzyme or enzyme-complex involved in the hydrolysis has been given name as cellulases. Cellulase catalyzes the conversion of insoluble cellulose to simple, water soluble products (Alexander, 1961). Cellulase is a multienzyme system composed of several enzymes with numerous isozymes, which act in synergy (Grassin & Fauquembergue, 1996). The basic enzymatic process for the depolymerization of cellulose requires three types of enzymes: Endoglucanase (EG or CX), hydrolyses internal β -1,4 glucan chain of cellulose at random, primarily within amorphous regions and display low hydrolytic activity toward crystalline cellulose (Walsh, 2002; Grassin & Fauquembergue, 1996); Exoglucanase i.e., exoacting cellobiohydrolases (CBH), removes cellobiose from the non-reducing end of cello-oligosaccharide and of crystalline, amorphous and acid or alkali treated cellulose; Cellobiase or β -glucosidase (BGL), hydrolyses cellobiose to yield two molecules of glucose which completes the depolymerization of cellulose (Himmel *et al.*, 1994).

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EVALUATION OF SOME BIOCHEMICAL CHANGES IN SOYABEAN CROP INFECTED WITH LEAF SPOT DISEASE

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ABSTRACT

Leaf spot is most common infectious disease recorded on soybean crop (*Glycine max* L. Merrill.) causing more than 30 per cent yield losses. Present study was carried out to evaluate the changes occurring in biochemical's viz., total sugar, reducing sugar, non-reducing sugar, protein and fat in healthy as well as infected foliage of soybean crop. Results showed that in diseased foliage total sugar content was reduced drastically over healthy one, reducing sugar and non-reducing sugar contents were higher in healthy leaves (22.5% and 12.5 % respectively) than infected (8.5% and 7.3 %, respectively). Crude protein were higher (11.8%) in healthy leaves than infected (13.8%), from this work it is evident that the infection of Leaf spot disease causes drastic alterations in amounts of biochemical's in soybean-crop.

KEYWORDS: Biochemicals, Crude protein, *Glycine max*, non-reducing sugar

INTRODUCTION

Soybean belongs to legume plant it has received a great attention all over the world as an important source of nutrition. The protein derived from soybean is comparatively cheaper than the animal source of protein (Kaul and Das, 1996). Soybean plant fixes atmospheric nitrogen as a result crop is less dependent on nitrogen chemical fertilizer (Hoque, 1978). Most of the people in India consume soybean oil in their daily food dishes. A large number of soya products are successfully developed. Soyproducts such as soyaflour, soyanilk, soyabread, soyabiscuits etc. are commercially produced in India.

All part of soybean plants are susceptible to disease more than hundred pathogens are known to affect soybean of which 35 are economically important diseases (Sinclair and Blackman, 1989). Soybean disease reduce yield on an average 10 to 30 % (Sinclair, 1994). In India soybean suffer from many diseases among them leaf spot disease is an important disease that reduce yield of crop. Leaf spot disease is caused by various fungal pathogen viz., *Cercospora* spp., *Alternaria* spp., *Septoria* spp. etc.

The common biochemical constituents like chlorophyll, sugar, proteins and fats are important in imparting resistance to crop plant but almost all living plant show biochemical changes after infected by infectious agents (Bora and Joshi, 2013). Biochemical changes due to

infection reported by many workers in different plant by different plant pathogens (Bashan, 1986, Gupta et al., 1980, and Waghmare et al., 2012) but there is little information seems to be available for biochemical changes in soybean crop due to leaf spot disease.

Hence present investigation was carried with the objective to study the different biochemical changes in foliage of soybean infected with leaf spot disease.

MATERIALS AND METHODS

For the quantitative estimation of primary metabolites different protocols were used. Leaves of the healthy and infested plant were collected, washed with distilled water, shade dried and powdered. The powder was used for analysis of total sugar, Reducing and non reducing sugar, protein and fat of the soybean plants.

Estimation of total sugar: This was done by the Anthrone standard method (Sadasivan and Manikam, 2008). A standard curve was obtained using the following concentration of glucose in (mg/ml) 0.00, 0.20, 0.40, 0.60, 0.80 and 1.00. 0.5 ml aliquots of each healthy and infected sample solution was measured into test-tube and 4ml anthrone solution added. This was heated for 8 minutes in boiling water bath. It was then allowed to cool. The absorbance was then read off a spectrophotometer at 630nm. The sugar concentration was then obtained by plotting standard curve.



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**IN VITRO EVALUATION OF SOME PLANT EXTRACTS AGAINST *ALTERNARIA
ALTERNATA* CAUSING LEAF SPOT OF SOYABEAN**

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ABSTRACT

In vitro antifungal activity of aqueous extract of four different plant species viz. *Ocimum sanctum*, *Datura stramonium*, *Xanthium stramonium* and *Cassia tora* were tested against plant pathogenic fungus *Alternaria alternata*. This fungus causes Leaf spot disease in soybean crop. The plant extracts were taken in five different concentrations (5%, 10%, 15%, 20%, 25%) and evaluated the radial growth of mycelia. All plant extracts showed good antifungal properties. Among four plant species *Datura stramonium* at 25% concentration show maximum percentage of inhibition (56%) and it is followed by *Ocimum sanctum* (50%), *Cassia tora* (36%), *Xanthium stramonium* (25%).

KEYWORDS: *Alternaria alternata*, Antifungal activity, Leaf spot.

INTRODUCTION

Soybean (*Glycine max* L.Merr) has received important position among protein sources. Most of Indian people consume soybean oil in their daily dishes due to its high quality. A large number of soya products are successfully developed (Shovan et. al. 2008).

All parts of soybean plant are susceptible to disease, more than hundred pathogens are known to affect soybean, of which thirty five are of economically important (Sinclair and Backman, 1989). Many pathogen including *Fusarium oxysporum*, *Rhizoctonia solani* and *Alternaria alternata* are causing severe damage to agricultural crops (Hadizadeh et. al. 2009). *Alternaria alternata* an important fungal pathogen which mostly cause disease on aerial part of many plants worldwide (Rotem, 1998). It causes Leaf spot disease on soybean crop. Recently in different parts of the world attention has been paid towards exploitation of higher plant products as novel chemo therapeutants in crop protection (Singh and Shrivastava, 2013). To control the use chemical pesticides more emphasis should be done on identification of beneficial natural biopesticides hence Plants can be a good source of biopesticides. They are comparatively less toxic and ecofriendly (Aslam et al 2010).

Therefore the present study aims to find the cost effective and eco-friendly bio-compound for management of leaf spot of soybean using aqueous extract of four different plant species viz. *Ocimum*

sanctum, *Datura stramonium*, *Xanthium stramonium* and *Cassia tora* were tested against plant pathogenic fungus *Alternaria alternata*.

MATERIALS AND METHODS

1. Isolation of pathogen

The fungal strain *Alternaria alternata* were originally isolated from naturally diseased soybean plant collected from agricultural field of Dharmabad region. The fungus was cultured on Martin rose Bengal streptomycin agar plate and incubated at 28±2°C for one week. Purification of resulting isolates was done using the hyphal tip technique and single spore technique to obtain the pure culture. Detected isolates were then transferred into slants of Martin rose Bengal streptomycin agar and kept at 4°C for further studies. It is then identified with microscopically examination (Ruksana et al 2010).

2. Preparation of plant extract

The selected plants were collected from Dharmabad region and washed thoroughly with tap water and air dried. 10 gm of fresh plant leaves were grind using mortar and pestle adding equal amount of sterilized distilled water (1:1, W/V).

3. Antifungal activity of plant extract

The effect of plant extract taken into study against the mycelia growth of *Alternaria alternata* was tested by poisoned food technique (Dhingra and Sinclair 1985). An appropriate quantity of each extract was incorporated in sterilised martin rose Bengal streptomycin agar to



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Production and Characterization of Citric Acid by *Aspergillusniger*
Using Fruit Waste

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ABSTRACT:

Citric acid is a one of the weak organic acid, which is used in many pharmaceutical and in other industrial food products. Increased demand of citric acid has led to work on high yielding fermentable strains of microorganisms and cheaper fermentation substrate in many countries. The present study suggests that in near future fruit peels waste could be one of the substrate for citric acid production at industrial scale worldwide. Production of citric acid was carried out by *Aspergillusniger* in the medium with dry fruit peels powder and wet fruit peels. Maximum citric acid production was obtained by using citrus wet peel waste i.e., 3.25 g/kg of citric acid in the medium with dry fruit peel waste and 5.25g/kg with wet fruit peels. Citric acid production was found to be 2.75, 2.63, 1.75, and 1.5 and 0.75g/kg of the substrate in the medium with dry fruit peel while, 0.16, 0.13, 0.19, 0.15 and 0.22g/kg of the substrate with wet fruit peel waste by using fruit peel waste of Citrus.

Keywords: Citric acid; *Aspergillusniger*; fruit waste.

Introduction:

Citric acid is a one of the weak organic acid found in citrus fruit. It is used as natural preservative and is also used to add an acidic (sour) taste to food and soft drinks. In biochemical pathways it is an important intermediate in the citric acid cycle and therefore occurs in the metabolism of almost all form of life. The high concentration of citric acid can damage hair, bleach it and can cause skin and eye irritation. The excess amount of citric acid is metabolized and eliminated

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Production and Optimization of Citric Acid by *Aspergillus niger* ARU1 from Pomegranate Fruit Waste

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ABSTRACT: Citric acid is one of the most significant organic acids having an ever ending demand in the world. The citric acid production has enhanced speedily, in 2008 reaching about 1.7 million tons per annum having 5% predicted annual increase in the production rate so as to gather the growing needs of the global market (Hayder Khaleel Qurban Ali, 2012). Citric acid is utilized in the food and beverage industry to flavor the fruit juices, marmalade, and candy ice cream. In the pharmaceutical industry, citric acid is employed as a preservative for stored blood, ointments, tablets and cosmetics. In the chemical industry, it is utilized as an antifoam agent for the treatment of textiles (Omosiyi Koforiji, 2010). Recently, the major production of citric acid was achieved by means of microbial fermentation, as it was economically feasible and easy to handle (Hayder Khaleel Qurban Ali, 2012).

Keywords: Citric acid; *Aspergillus niger*; pomegranate.

Introduction:

The two most principal microbial sources are fungi and bacteria. But fungus remains the ideal sources for the production of citric acid. *Aspergillus niger* was the most commonly used fungus for the citric acid production due to its high yield and relatively high tolerance to the acid accumulation (Pandey P., 2013). It has been employed by many researchers and in many research studies, chiefly in solid-state fermentation (SSF), for its ability to live and grow in an environment analogous to its natural habitat. In the last 3 decades, solid-state fermentation (SSF) has gained great interest from researchers and industries as a complementary technique to the traditionally used submerged fermentation (SMF). The unique characteristics of solid-state fermentation, using solid materials, stimulated researchers to utilize the waste such as agro residual and agro industrial wastes, fruit waste as an substitute to raw materials for the citric acid production. Several advantages of Solid state fermentation over submerged fermentation have encouraged researchers to study and expand it, such as less risk of bacterial contamination, lower energy prerequisites and less environmental concerns regarding the disposal of solid waste (Sadia Javed, 2011). Today over 99% of the world's output is created using *Aspergillus niger*, *Aspergillus wentii*, *Aspergillus clavatus*, *Penicillium lanosum*, *Penicillium citrinum*, *Candida guilliermondii*, *Mucor piriformis*, *Trichoderma viride*, *Arthro bacter paraffinicus* and *Saccharomycopsis lipolytica* (Pandey P., 2013).


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Effect of physical parameters on Citric Acid production by *Aspergillus -niger* ARU1 LC 541742 from Fruit Waste.

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ABSTRACT: Citric acid is one of the most significant organic acids having an ever ending demand in the world. The two most principal microbial sources are fungi and bacteria. But fungus remains the ideal sources for the production of citric acid. *Aspergillus niger* was the most commonly used fungus for the citric acid production due to its high yield and relatively high tolerance to the acid accumulation (Pandey P., 2013). It has been employed by many researchers and in many research studies, chiefly in solid-state fermentation (SSF), for its ability to live and grow in an environment analogous to its natural habitat. In the last 3 decades, solid-state fermentation (SSF) has gained great interest from researchers and industries as a complementary technique to the traditionally used submerged fermentation (SMF). The unique characteristics of solid-state fermentation, using solid materials, stimulated researchers to utilize the waste such as agro residual and agro industrial wastes, fruit waste as an substitute to raw materials for the citric acid production. Several advantages of Solid state fermentation over submerged fermentation have encouraged researchers to study and expand it, such as less risk of bacterial contamination, lower energy prerequisites and less environmental concerns regarding the disposal of solid waste (Sadia Javed, 2011).

Keywords: Citric acid; *Aspergillus niger*; Orange Fruit Peel

Introduction:

One of the very important fungi used in fermentation industrial, *A. niger* has been employed for economical production of citric acid (Schuster *et al.*, 2002). According to Lesniak *et al.*, 2002, bulk hydrated materials and sugar by-product for production by *A. niger* the citric acid is produced commercially from the fermentation. According to Alvarez-Vasquez *et al.*, 2000, the requirement of worldwide more economical processes are

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Section A: Green Chemistry



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Purification and characterization of Laccase from a novel chlorpyrifos degrading bacterium from pesticide contaminated agricultural soil

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Abstract: Chlorpyrifos is one of the most widely used organophosphorus insecticides and the deleterious effects like neurotoxicity, genotoxicity of chlorpyrifos to humans, animals and aquatic life have caused much public concern. It is thus essential to develop bioremediation method to degrade and eliminate this pollutant from soil using enzyme systems such as laccases. A novel laccase producing chlorpyrifos degrading strain was isolated and identified by 16S rDNA gene analysis as *Bacillus massiliosenegalensis*. This strain utilized 50 mg L⁻¹ of chlorpyrifos as the sole carbon source and tolerated 100 mg L⁻¹ under optimum cultural conditions of temperature 30°C and pH 7. Under optimum conditions, *Bacillus massiliosenegalensis* metabolized the supplemented chlorpyrifos to 69% within 10 days of incubation. However, with chlorpyrifos 100 mg L⁻¹ the degradation percentage was 42%. Laccase produced by *Bacillus massiliosenegalensis* showed potential chlorpyrifos degradation ability. The laccase enzyme was partially purified by ion exchange chromatography with purification fold of 4.1 and specific activity of 62.54 Umg⁻¹. The enzyme was found

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IN VITRO CYTOTOXIC POTENTIAL OF MEDICINAL PLANT ALANGIUM SALVIFOLIUM AGAINST CANCER CELL LINES



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Dr. Narayan Dattatraya Totewad⁴, Dr D U Gawai⁵

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Abstract

The use of medicinal plants to treat diseases is the most common remedy. The seeds of *Alangium salvifolium* are rich in phytochemical components. They exert antioxidant and anticancer effects known for their beneficial effects on human health. The aim of this study was to investigate the antioxidant and cytotoxic potential of *Alangium salvifolium* seed extracts against human skin melanoma (A375) and human skin carcinoma (A431) cell lines in vitro. Phytochemicals and antioxidant activity were investigated in ethanol and ethyl acetate extracts of *Alangium salvifolium* seeds using standard methods. In vitro cytotoxicity assays were performed against human skin melanoma (A375) and human skin carcinoma (A431) cell lines using the MTT assay. There was results showed that *Alangium salvifolium* has antioxidant potential. The observations of the MTT cell cytotoxicity study indicate that the ethanolic and ethyl acetate extract of the plant exhibits significant cytotoxic properties against the A431 cell lines and moderate cytotoxic properties against the A375 cell lines. Overall, the ethanolic extract shows effective antioxidant potential and cytotoxicity against both A431 and A375 cell lines. It appears that *Alangium salvifolium* seed extracts may prove to be promising anti-cancer cell agents if the ethanolic extract is specific. However, further studies are needed to confirm these results in vivo.

Keywords : cytotoxic potential, Antioxidant, Medicinal plant, cancer, cell line

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ANTIFUNGAL ACTIVITY OF LEAF EXTRACTS AGAINST FUNGAL PATHOGENS ASSOCIATED WITH SOYBEAN SEEDS

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Key words: Soybean seeds, aqueous leaf extracts, antifungal activity.

Present investigation was undertaken to find out the potential of aqueous plant extracts as antifungal agents by employing dry mycelial weight method (Kumar and Prasad, 1992). Seeds of Soybean (*Glycine max* (L.) Merr.) were collected from local market in pre-sterilized cotton bags and brought to the laboratory. Seed-borne fungi were isolated by blotter test method (ISTA, 1966). The isolated fungi were identified following Barnett and Hunter (1972). All eight identified fungi were sub-cultured and employed for present study.

Plant species viz. *Wihania somnifera* (L.) Dunal, *Datura strominum* L., *Jatropha curcas* L., *Lantana camara* L., *Calotropis procera* (Aiton) W. T. Aiton, *Aegle marmelos* (L.), *Abrous precatorious* L., *Euphorbia tirucalli* L., *Sapindus trifoliatus* L. and *Annona squamosa* L. were collected and identified following Naik (1998). Fresh and healthy leaves of these plants were thoroughly washed with sterile distilled water. Twenty g leaves were crushed in distilled water, filtered through double layered muslin cloth and subsequently through Whatman filter paper, the volume was made up to 100 ml and used to assess antifungal activity. In order to find out antifungal activities of leaf extracts, requisite quantity of the plant extract was added to glucose nitrate broth and the medium was sterilized at 15 lbs pressure for 20 minutes. Spore suspension was inoculated to the

medium under aseptic conditions and the flasks were incubated for seven days at 22 ± 1 °C. Medium without plant extract served as control. After incubation, the mycelial mat was collected by filtration through Whatman filter paper, dried and dry mycelial weight was measured. Each treatment was replicated thrice.

Maximum antifungal activity was observed with the leaf extracts of *C. procera*, *J. curcas* and *L. camara*. Leaf extract of *W. somnifera* showed antifungal activity against *P. chrysogenum* and *F. oxysporum*. *D. strominum* showed inhibitory effect against *F. oxysporum*. The results supported the findings of Rajmane et al; (2012). Leaf extract of *J. curcas* showed anti fungal activity against *A. niger*, *A. flavus*, *F. oxysporum*, *A. alternata* and *C. lunata*.

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Studies on Quantitative Analysis of Rhizosphere and Non-Rhizosphere Mycoflora at Different Stages of Plant Growth in Different Varieties of Pigeon Pea [*Cajanus cajan* (L.) Millsp.]

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ABSTRACT

The rhizosphere and non-rhizosphere mycoflora of ten different varieties of pigeon pea [*Cajanus cajan* (L.) Millsp.] were studied in relation to different stages of plant growth (non-flowering, flowering and fruiting stages). From the results obtained it was found that always the fungal population was higher in rhizosphere than the non-rhizosphere in all the varieties studied. Species of *Aspergillus*, *Fusarium* and *Penicillium* were very commonly isolated from the rhizosphere. The rhizosphere mycoflora was very high at flowering stage of plant growth i.e. the microbial population was increased with age of plant up to flowering stage then it was decreased. In the present study the quantitative analysis of rhizosphere soil mycoflora of ten varieties of pigeon pea, at different stages of plant growth was also studied. The number of fungi per gram of dry soil, R:S ratio and the number of fungal species was also higher at flowering stage of plant growth. The variety BDN-708 exerted maximum rhizosphere effect at all the different stages while ICPL-2376 exerted minimum rhizosphere effect.

Key words: Rhizosphere, Mycoflora, Pigeon pea varieties.

INTRODUCTION

Pigeon pea (*Cajanus cajan* (L.) Millsp.) is an important legume crop of rain fed agriculture in the semiarid tropics. It is second most important food legume of India. The Indian subcontinent, eastern Africa and Central America are the world's three main pigeon pea producing areas. Pigeon pea crop is cultivated in more than twenty five tropical and subtropical countries, either as a sole crop or mixed crop with cereals, such

as sorghum, pearl millet or maize or with other legumes, such as peanuts, soybean, black gram and cotton. Being a legume capable of symbiosis with *Rhizobia*, the pigeon pea enriches soil through symbiotic nitrogen fixation. Rhizosphere is a metabolically active region with conspicuous variations in its surrounding mycoflora depending upon the root exudates, genus, species, variety, age and phase of growth, soil, environmental conditions and foliar sprays etc.

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AN ETHNOMEDICINAL SURVEY OF WILD VEGETABLES FROM NANDED DISTRICT (MS), INDIA

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ABSTRACT

The use of wild vegetables as a source of food is well documented all over the world. Wild food plants are commonly used in the traditional diets of indigenous people in many parts of the world, including India. Studies on the role of wild leafy and fruit vegetables in food security could provide important information for the development of policies on careful exploitation of natural resources for human sustenance. This study aimed to assess the medicinal uses/values of selected wild edible vegetables consumed as a source of food by local communities from the Nanded District. In the present study total of thirty-nine different wild vegetables were reported to be consumed by local tribal peoples which have a reported ethnomedicinal value in the literature. The reported 39 wild vegetables were found to be distributed within 23 different families. Among them, members of Cucurbitaceae (06) have been dominated the overall count, followed by Malvaceae (04) and Amaranthaceae (04). Leaves and Fruits are the common part to be used in the preparation of vegetable dishes. The study suggests consumption of wild vegetables with medicinal values should be encouraged since it may assist in the well-being of communities in/of lower economic strata. The results of the study also indicate that the health of tribal people is sturdy may be because of their diversified dietary contents. The wild vegetables are nutritionally rich, organic, and high in phytoconstituents, especially secondary metabolites, minerals, and vitamins.

Keywords: Wild Vegetables, Cucurbitaceae, Ethnomedicine, Phytoconstituents, Tribal community.

1. INTRODUCTION

Wild vegetables refer to plant species that are not cultivated or domesticated but are accessible from various natural habitations and used as food [1]. Recently people focus more on limited species that are preferred as dietary supplements obtainable from naturalized species and resulted in less attention to native species [2]. Leafy and Fruits vegetables are important sources of minerals, fiber, and vitamins, which provide essential nutrients for human health. In most cases, rural communities depend on wild resources including wild vegetables to meet their food needs in periods of food crisis. The term wild-food is used to describe all plant resources outside of agricultural areas that are harvested or collected for human consumption in forests, savannah, and other bushland areas. The nutritional role and health benefits of wild vegetables have been reported in many surveys worldwide [3-6].

Many wild plants having rich nutritional contents [7] are important as dietary supplements, providing

elements, vitamins, and minerals. According to Food and Agricultural Organization (FAO) report, at least one billion people are thought to use wild food in their diet [8]. The present study aimed to document indigenous leafy and fruit species used as vegetables by local tribal communities (Andh, Koli-Mahadev, Dongar-Koli, Kolam, Mannerwarlu, Gond, Raj Gond, Bhil, Bhil garsia) from Nanded District. These indigenous communities are still relying on their traditional knowledge for healthy livelihood.

Wild vegetables are important in folk traditions and on various occasions, a special plant is recommended to be eaten. Therefore, ethnodirected research will be useful in the discovery and development of the new drug as well as in search of new food resources. This study is an attempt to know about traditionally used wild edible plants by the indigenous peoples from deep tribal pockets. It will also help to know about these vegetables before the dramatic loss of traditional knowledge regarding wild vegetables.

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BIOSYNTHESIS, CHARACTERIZATION, AND ANTIBACTERIAL ACTIVITY OF SILVER NANOPARTICLES FROM AN ENDOPHYTIC FUNGUS *Alanphillipsia aloeigena*

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Abstract:

Recently the attentions of many researchers increased towards biosynthesis of nanoparticles due to their wide applications in industries, agriculture and medicine etc. Several biosynthesized metal nanoparticles have been found to be more effective against the growth of many infectious pathogenic microorganisms. The present study emphasizes on the biosynthesis of extracellular silver nanoparticles (AgNPs) from an endophytic fungus *Alanphillipsia aloeigena* isolated and identified by using 18s rRNA ITS region from different parts of *Maytenus emarginata* (Willd.) Ding Hou. Biosynthesized AgNPs characterized for UV-Visible Spectroscopy, FTIR, TEM and XRD. UV-Visible Spectroscopy absorption shows peak at 445 nm, TEM analysis shows nanoparticles were spherical and 20-70nm in size, FTIR confirms the presence of different biomolecules and XRD confirms silver nanoparticles are crystalline in nature. Antibacterial activity of biosynthesized silver nanoparticles analysed the zone of inhibition around the wells were measured. Result revealed that biosynthesized AgNPs of *Alanphillipsia aloeigena* were effective against *Klebsiella pneumoniae*, *Eischerchia coli*, *Styphalococcus aureus*, *Salmonella typhi* and no zone of inhibition against *Shigella Sp*. Thus, the present study concludes with the eco-friendly & biogenic method for synthesis of AgNPs with effective antibacterial activity against clinically important human pathogens.

Keywords: Endophyte, *Maytenus emarginata*, *A.aloeigena*, AgNPs & antibacterial.

Introduction:

Myconanotechnology is an emerging field of modern science, where fungi are being exploited for the green synthesis of nanoparticles with desirable shape and size. Fungi have a more advantage over bacteria as well as actinomycetes, because fungi are excellent secretors of proteins leads to a higher yield of green nanoparticles which are highly stable, eco-friendly, cost-effective, and non-toxic.

Recently, a wide range of potential fungal species are being screened to produce different green nanoparticles, such as silver, gold, silica, selenium, platinum, zirconium, titanium, zinc oxide, copper, chitosan and magnetite reported by various researchers.

In traditional method fungi have been identified and classified on the basis of morphological and microscopic observation of different characters, later by ultra-structural and biochemical studies, which however did not always differentiate between analogies and homologies (Weber, 2009). However, the frequent absence of distinctive morphological character for identification reinforces the need for alternate DNA based identification of enormous microscopic species and socioeconomic relevance of fungi (Seifert, et al., 2007).

Amongst fungi, not much work has been done on mycosynthesis of green silver nanoparticles production from endophytic fungi of different plants. A very few report such as *Penicillium* spp isolated from the medicinal plant *Cewella asiatica* and *Curcuma longa* (Devi, 2012; Dattu et al. 2013). Mycosynthesis of silver nanoparticles from endophytic fungi, *Penicillium* species of *Glycosmis mauritiana*, (Govindappa et al. 2016). Endophytic fungi namely, *Penicillium* sp., *Alternaria* sp., *Aspergillus* sp and *Cladosporium* sp from different parts of *Calotropis procera* (Debjani et al., 2016).

In recent years the development of resistant pathogenic strains of pathogen and emergence of new disease causing agents has been increased, so that pathogenic resistance is one of the world's most emerging problems in public healthcare leads to increasing the demand for novel effective bioactive compounds in healthcare, agriculture, environment and industry. Therefore, it is necessary to develop and design a novel strategy to overcome such type of new limitations raised in different areas of society.

Since plants endophytes have been a major source of bioactive compounds for drug discovery. Plant endophytic fungi are novel and important for production of natural bioactive compounds with their potential use in medicine, agriculture and food industry. The various important bioactive compounds from endophytic fungi isolated which shows insecticidal, antimicrobial, radical scavenging, plant growth promoting, antidiabetic and anticancer activities.

Extracellular silver nanoparticles (AgNPs) of *Aspergillus flavus* shows highest zone of inhibition against *S. flexneri* and *P. mirabilis* at the concentration of 100µg/ml (Wilson et al., 2016). Silver nanoparticles of *Fusarium oxysporum* show antibacterial activity against pathogenic bacteria (Gholami et al., 2013). Extracellular biosynthesized silver nanoparticles of Endophytic fungi *Penicillium* result revealed that the maximum zone of inhibition 21 mm and 15mm showed against *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*, where as *Eischerchia coli* showed the least zone of inhibition of 13mm at 80 µl of concentration (Dattu et al.,




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Biodegradation of Para-Nitro Aniline from Soil Sample of Nanded District (MS), India

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ABSTRACT

Pesticides are used to control various pests and excess use may destroy the plants. They form one of the important groups of xenobiotics compounds. Parathion is one of the pesticides which is used for controlling foliar pests. It is hazardous to humans & animals also. During its use when it is dropped in the soil, it undergoes microbial degradation and is converted into para-nitroaniline, which is also a hazard. The response of three bacterial strains showing tolerance to the para-nitroaniline i.e., *Azotobacter*, *Pseudomonas*, and *Bacillus* was selected and their degradation activity was studied by determining the susceptibility of the strain towards the para-nitroaniline and spectrophotometric analysis and observed MIC was 320 ppm and percent of degradation increases with time. The MIC for *Bacillus* spp. is 320 ppm (31mm) *Pseudomonas* spp. is 160 ppm (12mm) and *Azotobacter* spp. 160 ppm (12 mm). After 96 hrs. of incubation, the percent degradation of *Bacillus* spp. is 42% *Pseudomonas* is 41% and *Azotobacter* is 40%.

I. INTRODUCTION

Nitro-aromatic compounds are used extensively in dyes. Pesticide, herbicide, plasticizers, explosive and solvent, for example, nitrophenol, nitro anilines are released into the environment as parathion (Sethunathan, N. and Yoshida, T., 1973), hydrolytic products of methyl parathion like phosphorous insecticides (Gupte, S.P. and Chaudhari, R.V., 1988), herbicides (De Steven, D., 1991) or industrial waste (Marvin-Sikkema, F.D., and De Bont, J.A.M., 1994; Spain, J.C. 1995). Parathion is an organophosphorus pesticide that is used only for limited plants because of its high toxicity and risk, it is classified as Restricted use pesticide (RUP). It interferes with the activity of cholinesterase, an enzyme that is essential for the proper working of the nervous system of insects. Human parathion direct exposure to humans inhibits cholinesterase and produces incoordination, slurred speech, loss of reflexes, and paralysis of the body extremities and respiratory muscle death may be caused by respiratory failure or cardiac arrest.

Soil microorganisms degrade parathion by three different pathways into three different compounds. Parathion after its microbial degradation gets converted into Para-nitro aniline. At alkaline pH organism, *Pseudomonas*

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Effect of organic and inorganic agricultural inputs on soil nutrient and mycoflora of cotton field

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Abstract

It is necessary to study soil health in terms of soil nutrient properties, soil microbial activity and diversity in conventionally and organically managed field for sustainable development in agriculture. In present investigation, different fermented organic inputs like farm yard manure, Beejamruth and Jeevamruth on soil nutrient parameters, mycoflora population and species diversity in Cotton field for three successive years.

The soil amendments with organic inputs increased soil nutrient parameters like improvement in organic carbon (OC), Phosphorus (P), Potassium (K), water holding capacity (WHC) and positive decrease in soil pH and electrical conductivity over inorganic farming. The application of organic inputs enhances mycoflora colony forming unit (CFU) and more species diversity as compared to inorganic farming. From result it is confirmed that for maintenance of soil health i.e. soil fertility and microbial diversity, organic inputs is effective alternative to reduce the loss of over use of inorganic inputs towards sustainable and eco-friendly agricultural development for future.

Keywords: soil nutrient properties, mycoflora, cotton, organic & inorganic inputs

1. Introduction

In modern agriculture the quality soil can be measured directly by evaluating soil indicators like physical, chemical, and biological properties, processes, or characteristics of soils. Biomass, community structure, and specific functions of soil microorganisms appear to be of major importance for general soil functions and if detectable could serve as sensitive soil quality indicators. Since microbial soil communities strongly depend on the conditions of the habitat they colonize, microbiological characteristics of a soil may provide indicators, which integrate short-, middle- and long term changes in soil quality.

During past decades, conventionally managed agricultural system has used synthetic fertilizers and pesticides to improve crop productivity. This intensive use of agrochemicals definitely reduced the biodiversity, increase in irreversible soil erosion and reduce soil organic matter (Dick, 1992; Schiavon *et al.*, 1995) [1, 2]. Since chemical fertilizers and pesticides are being widely used by farmers in peri-urban agriculture, it is important to consider their possible impact on soil health. A unique balance of chemical, physical, and biological especially microbial biomass contributes toward maintaining soil health. The soil microflora largely depends on the type of soil, temperature, moisture, plant growth nutrients, pH, and many other factors which may vary between locations but also within a single plot and over very small distances (OECD, 2007) [3].

To overcome the adverse effect of chemical fertilizers, farmers are turning towards organic farming. This system can reduce some negative effects attributed to conventional agriculture and has potential benefits in enhancing soil quality (Mader *et al.*, 2002) [4]. Now a day's organic farming

basically runs for cultivation of land and crops as to keep soil fertile by use of organic fertilizers like FYM, biological materials, vermicompost & beneficial microbes to add the nutrients to crops for increased sustainable production.

Several investigations shows application of chicken manure increases bacterial and fungal count than conventional farming (Wang *et al.*, 1995). The soil microbes are always higher in organic field compared to inorganic field (Bolton *et al.*, 1982) [5]. The addition of FYM as an organic fertilizer increases in fungal population (Das and Dkhar, 2010) [6]. Several report shows enhancement in soil microbial composition by organic amendments (Wada and Toyota, 2004) [7]. In organic farming there is 10-26 % increase in microbial biomass (Fraser *et al.*, 1994) [8].

The addition of organic fertilizers at various combinations significantly increases rhizosphere microbial population than without organic fertilizers (Das *et al.*, 2010) [9]. The different organic agricultural practice improves biodiversity, biological cycles and biological activity for optimization of natural ecosystem for sustainable development (Samman *et al.*, 2008) [10].

Comparative study on organic and inorganic farming in relation to soil physicochemical parameters, soil microbes and yield shows that the organic farming shows positive influence on soil health. While inorganic farming shows negative impact on soil health. The regular crop rotation and absence of synthetic nutrients and pesticides in organic farming results in increase in soil quality and microbial activity in comparison with conventional farming (Shannon *et al.*, 2002) [11]. Organic agriculture fields significantly higher in numbers of bacteria by 70%, actinobacteria by 290%, cultivable filamentous fungi by 110%, yeasts and maltose fermenting bacteria by 190% in



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ANTIFUNGAL ACTIVITY OF SILVER NANOPARTICLES SYNTHESIZED WITH THE HELP OF *FUSARIUM BRACHYGIBBOSUM*

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ABSTRACT

During present study, *Fusarium brachygibbosum* was isolated from the host plant *Maytenus emarginata* (Willd.) Ding Hou. and employed for biosynthesis of extracellular silver nanoparticles (AgNP). The size of the nanoparticles ranged from 15 to 60 nm. These silver nanoparticles were found to be effective against *Fusarium oxysporum*, *Fusarium solani*, *Alternaria solani*, *Alternaria alternata*, *Botrytis cinerea*, *Pythium aphanidermatum* and *Sclerotinia sclerotiorum*. With the increase in concentration of silver nanoparticles, the percent inhibition increased.

Key words: *Fusarium brachygibbosum*, silver nanoparticles (AgNPs), Antifungal, Phytopathogens.

Introduction:-

Various physical and chemical methods for the synthesis of nanoparticles have been suggested, however, it may lead to either contamination from precursor chemicals, as well as generation of hazardous by-products, which may cause environmental pollution (Sunkar and Nachiyar, 2012). In view of this present study was undertaken on bio-synthesis of silver nanoparticles (AgNPs) with the help of endophytic fungi as an alternative to the chemical method.

The AgNPs can be further used as an antimicrobial agents for the management of various plant diseases (Mishra *et al.*, 2012). During present study antifungal activity of AgNPs synthesized by using an *Fusarium brachygibbosum* isolated from a medicinal plant *Maytenus emarginata* (Willd.) Ding Hou.

Materials and methods:-

Plant parts such as stem and leaves of *Maytenus emarginata* (Willd.) were collected from parts of Nanded and Hingoli districts

brought to the laboratory for the isolation of endophytic fungus, *Fusarium brachygibbosum*, following Hallman *et al.* (2007) and Selvakumar *et al.* (2014).

The plant samples were washed in running tap water, soaked in 0.1 % mercury chloride, surface sterilized by using ethanol, followed by 2% Sodium hypochlorite solution for 2-4 minutes and then dipped in distilled water. The plant parts were chopped into small pieces and inoculated in Petri dishes containing Czapadox agar and potato dextrose agar (PDA) medium, supplemented with streptomycin. The Petri dishes were incubated at room temperature ($28 \pm 2^\circ\text{C}$) for 15 days. The fungi, growing on the medium were sub cultured on separate Czapadox agar medium, on plates as well as slants.

The fungi were identified based on the morphological features such as colony morphology, pigmentation, growth pattern, spore structures and other hyphal characteristics following the relevant mycological literature and standard works of Nagamani *et al.*, (2006) and Barnett (1975) and confirmed by using 18 s rRNA universal

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Purification and immobilization of thermostable serine alkaline protease from *Bacillus subtilis*

Prita S Borkar

Abstract

A protease producing bacteria was isolated from soil and identified as *Bacillus subtilis*. Of the 42 isolate screened, isolate S-8 was identified as thermostable alkaline protease producer. The protease was purified by ion exchange chromatography, and showed apparent molecular weight of 19,000 kD and an isoelectric point of 9.0. The enzyme had optimal proteolytic activities over a broad pH range (8-11) and exhibited temperature optimum of 60 °C. The protease was immobilized on tri (4- formyl phenoxy) cyanurate to form Schiff's base. The native and immobilized protease was used for catalyzing the hydrolysis of proteins in aqueous medium. The immobilized protease exhibited shift in optimal pH from 10 to 10.5 and optimal temperature from 60 °C to 65 °C. The immobilized protease revealed 10-15% increase in thermal stability and retained 70% of its initial activity after 3 cycles.

Keywords: Protease, *Bacillus subtilis*, multipoint binding, immobilization

Introduction

Proteases are the single class of enzymes, which occupy a pivotal position with respect to their applications in both physiological and commercial fields. Among the various proteases, bacterial proteases are the most significant, compared with animal and fungal proteases. And among bacteria, *Bacillus* species are specific producers of extracellular proteases. These proteases have wide applications in pharmaceutical, leather, laundry, food and waste processing industries (Paster *et al.* 2001) [1]. Alkaline proteases from high yielding strains have been studied extensively; one of the major drawbacks affecting the stability at alkaline pH of enzymes recovered from thermophiles is that enzymes from alkalophiles confer stability in a wide pH range but are also usually thermolabile. Thus, it is desirable to search for new proteases with novel properties from as many sources as possible. Global requirements of thermostable biocatalysts are far greater than those of the mesophiles of which proteases contribute two-thirds (Bey and Gupta, 2003; Gupta *et al.* 2002) [2, 3]. Thermostable proteases are advantageous in some applications because higher processing temperatures can be employed resulting in faster reaction rates, increase in solubility of nongaseous reactants and products and reduced incidence of microbial contamination by mesophilic organisms (Folasade and Joshua, 2005) [4]. The enzyme immobilization technologies have been developed based mostly on the consideration of stability and reusability of biocatalysts (Tischer and Wedekind, 1999) [5]. The previous efforts for the multiple binding of enzymes have been conducted mostly with organic synthetic polymers because of the ease of fabrication of desirable structures and the availability of reactive functional groups. Organic polymers can achieve considerably high enzyme loading (Borros *et al.* 2003; Balcao *et al.* 2001; Wang *et al.* 1997) [6, 7, 8]. The covalent coupling of enzyme can produce a loss of activity due to the influence of the coupling conditions and to conformational changes in enzyme structure. However, irreversible binding of the carrier during covalent coupling does not allow the recovery of the carrier from the carrier-enzyme complex (Huang *et al.* 1997) [9]. In the present work we report certain physical and biochemical properties of protease produced by newly isolated strain of *Bacillus subtilis* S-8. An attempt was also made to explore the proteolytic activity of *B. subtilis* protease covalently bound to tri (4-formyl phenoxy) cyanurate via multipoint attachment. The catalytic behavior of the immobilized enzyme was examined on casein in terms of enzyme activity, stability and reuse in an aqueous medium at variable pH and temperature.

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Continuous production of Urocanic acid by immobilized *Pseudomonas aeruginosa* species

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ABSTRACT: Urocanic acid (UA), an intermediate of L-histidine catabolism is commonly used as sun-screening agent in cosmetics and medicines. In the present work, an effort has been made to isolate the urocanic acid producing strain (*Pseudomonas aeruginosa*) and optimized at varied culture conditions in submerged fermentation like pH, temperature, incubation period and substrate concentration. Effect of carbon source, nitrogen source and metal ions were also studied. The results revealed that maximum Urocanic acid production was attained at pH 7.5 and temperature 40 °C using 0.4 % of histidine after 96 h of incubation. Carbon source (Glucose 2%, 2.104 mg/ml), nitrogen source (yeast extract 0.5 %, 1.936 mg/ml and metal ions (Mg⁺⁺ 0.1mM, 1.523 mg/ml) further enhances the Urocanic acid production. Immobilization of *Pseudomonas aeruginosa* in 1.5 % of calcium alginate beads increased the yield up to 2.245 mg/ml. Moreover, repetitive batch operation and storage stability study of immobilized cells revealed maximum UA production up to five batches of operation. When stored at 4 °C, the immobilized whole cells remained stable up to 4 weeks. Hence immobilized whole cells of *Pseudomonas aeruginosa* were beneficial for industrial urocanic acid production.

Key words: *Pseudomonas aeruginosa* / Urocanic acid/Optimization / Immobilization.

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I. INTRODUCTION

L-histidine ammonia-lyase [E.C.4.3.1.3] an enzyme responsible for conversion of L-histidine to ammonia and glutamic acid through urocanic acid (UA) have been described well from a variety of microorganisms viz. *Pseudomonas putida*, *Aerobacter aerogenes*, *Bacillus subtilis*, *Bacillus cereus*, *Mycobacterium avium*, *Salmonella typhimurium*, *Serratia marcescens*, *Vibrio cholera*, *Pseudomonas fluorescens*, *Pseudomonas aeruginosa* and *Pseudomonas testosteroni* [1]. The enzyme activity also occurs in liver, skin, blood serum and stratum corneum of higher animals and in plants such as spinach and sunflowers [2,3]. Production of UA may be suggested as a useful alternative to histamine as a spoilage index in Scombroid and other fish that are rich in endogenous histidine [4]. Metabolites of histidine (UA) produced in animal tissues functions as protective agent against ultraviolet radiation [5]. Commercially UA is used as sun-screening agent in cosmetics and medicines. The production of UA is usually carried out by microbial and enzymatic conversion using L-histidine [3,7]. Optimization and genetic modification studies was carried out for *Serratia marcescens* for UA production respectively [8].

One of the major advances in optimizing microbial biotechnological process lies in immobilization technology which can be defined as any process that restricts substrate or cells inside a given structure and limits their free diffusion or movement. Moreover, immobilization offers advantages such as ease of handling, easy cell separation from liquid medium, the possibility of repeated and continuous use of biocatalysts as well as an increase in enzyme stability and longevity in contrast to that of free cells. These factors lead to a subsequent increase in bioprocess efficiency [9,10].

Literature survey revealed efficient UA production by immobilization methods [11,12] The isolation and characterization of new producer strains using carbon and nitrogen sources appears to be also essential for the improvement of process economy [13]. Taking these points under consideration, an effort has been made to isolate the *Pseudomonas aeruginosa* strain from garden soil sample, optimized at varied culture conditions and immobilized in calcium alginate beads. These immobilized whole cells were used efficiently for industrial UA production.




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Pharmacological and nutritional importance of sea buckthorn (*Hippophae*)

Subhash Chandra, Rana Zafar, Pradeep Dwivedi, LP Shinde and Borkar Prita

Abstract

Sea buckthorn (*Hippophae rhamnoides*) also known as sea buckthorn is an ancient plant with modern virtues, due to its nutritional and medicinal value. It is a deciduous species, widely distributed all over the world, including India. It contains different kinds of nutrients and bioactive substances such as vitamins, carotenoids, flavonoids, polyunsaturated fatty acids, free amino acids and elemental components etc. The fruit is the main component of value, although the leaves are occasionally made into sea buckthorn tea. The juice from the fleshy tissue and seed as a single seed from each berry provides a nutritious beverage. The juice is high in suspended solids and very high in vitamin C and carotenoids. Medicinally, it has been proven to possess various pharmacological activities such as antioxidant, antimicrobial, antifungal, metabolic disorders, immunostimulatory activity, hepatoprotectant and anticancer activity. Several studies reveal the presence of various phytochemical constituents viz., flavonoids (isorhamnetin, quercetin, myricetin, kaempferol and their glycoside compounds), carotenoids (β and δ -carotene, lycopene, Zeaxanthin), few essential amino acids, sitosterol, triterpene, fatty acids, tannin acid, 5-hydroxytryptamine, umbelliferone, antioxidant vitamins and minerals in various parts of this plant. Studies on human and animals suggested that sea buckthorn may have various beneficial effects: cardioprotective, anti-atherogenic, antioxidant, anti-cancer, immunomodulatory, anti-bacterial, antiviral, and wound healing and anti-inflammatory. It could also be used for human and animal nutrition. Therefore, it would be worthwhile to perform more scientific research on this medicinal plant and to promote its large-scale utilization.

Keywords: Sea buckthorn, pharmacological, nutritional importance

Introduction

Seabuckthorn, found in the icy heights of the Himalaya, is a deciduous, thorny willow-like plant species native to Europe and Asia. It is a pioneer species and prefers to grow in low humid, alluvial gravel, wet landslips and riverside with brown rusty-scaly shoots (Lu, 1992). It is also a multipurpose fast growing species which is serving as a measure of biodiversity conservation, soil conservation, medicines, food, fodder and fuel wood. It has an extraordinary capacity to grow and survive under adverse conditions (-40 to 40°C) and has extensive subterranean rooting system with strong soil binding ability useful for soil stabilization, river bank control and water retention (TISC, 2001) [2]. Seabuckthorn berry is a very rich source of vitamins and is called treasure of bio-activity substance because of its over 190 bio-activity substances possessing unique medicinal properties (Maertz, 2006) [3]. For these reasons, it is also called a wonderful plant (Lu, 1992).

Seabuckthorn is also a highly efficient nitrogen-fixing plant and hence ideal for enhancing soil-fertility. It bears nitrogen-fixing *Frankia* bacteria in its root nodules, thus making it an ideal plant for mixed farming. An 8-10 year old Seabuckthorn forest can fix 18 Kg N/ha/Yr and greatly increases the phosphate and organic matter in soil. It is hence known to have an immense impact on the productivity of all varieties of plants, trees and crops, which grow in its vicinity.

For the farmers living in the mountains, seabuckthorn offers the opportunity to maintain a sustainable livelihood providing healthy foods, variety of medicines and protecting their land from soil erosion (Lu, 1992; Ansari, 2003) [1, 4]. The use of seabuckthorn illustrates how low input costs and careful planning can lead to quite substantial benefits; a good example of mountain perspective oriented sustainable development. It thus qualifies as a unique option for the simultaneous management of several problems emanating from the fragility, marginality, inaccessibility and diversity characterising mountain areas (Lu, 1992) [7].



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Synthesis, characterization and antibacterial activity of some N-alkyl benzimidazol piperazine fluoroquinolones

Authors

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Abstract

A series of N-alkyl benzimidazol piperazine fluoroquinolones with remarkable improvement in antimicrobial activity as compared to the moxifloxacin were synthesized and characterized by ¹H NMR, ¹³C NMR, IR, Mass and elemental analysis. These derivatives were evaluated for their invitro activity against *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Escherichia coli*, *Pseudomonas aeruginosa* and *Klebsiella pneumoniae*. The results showed that all the synthesized derivatives of novel fluoroquinolones possess antimicrobial activity. However, compound derivatives IV and V3 have antibacterial activities against *Pseudomonas*, *Klebsiella* and *Staphylococcus epidermidis*. Among all these derivatives, compound V3 exhibit potent inhibitory activity with MIC of 19 µg/mL.

Keywords: N-alkylbenzimidazolpiperazinefluoroquinolones, antimicrobial activity, MIC.

1. Introduction

Pathogenic bacteria can cause extensive damage to our bodies, including death.¹ Nowadays, about 70% of the bacteria that cause infections in hospitals are resistant to at least one of the drugs most commonly used for treatment. Increasing in resistance of bacteria that cause community acquired infections has also been documented especially in the *Staphylococci* and *Pneumococci* (*Streptococcus pneumoniae*), which are prevalent causes of disease and mortality. In a recent study, 25% of bacterial pneumonia cases were shown to be resistant to penicillin and an additional 25% of cases were resistant to more than one antibiotic.² Antibiotic resistance is a type of drug resistance where a microorganism is able to

exposure to an antibiotic. Bacteria are constantly exposed to use and misuse of antibiotics leading to the emergence of antibiotic-resistant strains which make the existing drugs ineffective.³ This ability of bacteria to develop resistance to the antibiotics currently used, warrants novel research into new families of antimicrobials. Literature survey reveals that fluorinated quinolones,⁴ are extensively used in medicinal chemistry, most of them were using notable worldwide patented drugs for antibacterial, for example, norfloxacin, fleroxacin, ciprofloxacin, lomefloxacin, ofloxacin, pefloxacin, enoxacin, grepafloxacin, sparfloxacin, trovafloxacin, clinafloxacin, moxifloxacin and gatifloxacin.⁵ In view of these observation herein, we report N-alkylation of 1H-



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Research Article

Synthesis of 1, 2, 3-triazolo-piperazines compounds and their screening for Anticancer activity using C6 Glioma cell lines

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Abstract: A series of 1,2,3-triazolo-piperazines compounds were synthesized and characterized by ¹H NMR, ¹³C NMR, IR, Mass spectroscopy and screened for anticancer activity using C6 Glioma cell lines. Among 15 compounds of triazole series, four of the compounds showed the most potent antiproliferative activity as well as good selectivity between cancer and normal cells. These compounds 1 (IX), 2 (VIII), 3 (IX2) and 4 (VII2) exhibited good anti-proliferation activity with IC₅₀ values of 0.05µM against C6 glioma cell lines evaluated *in vitro*.

Keywords: Piperazine; 1, 2, 3-triazole; anticancer activity

INTRODUCTION

Heterocycles containing Nitrogen comprising of triazoles, benzothiazoles, benzimidazoles, indoles, etc. constitute an important scaffold in biological science and medicinal chemistry, and has fascinating applications in drug discovery and development [1-4]. In particular, the synthesis of 1, 2, 3-triazoles has attracted considerable attention during the last years. Several potent pharmacological properties such as anti-bacterial [5], antimicrobial [6], antioxidant [6], anticancer [6], and antitubercular [6] of 1, 2, 3-triazole

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Section B: Herbal Chemistry



Research Article

CODEN (USA): IJGHAY

Studies on Nutritional and Medicinal Values of *Perilla frutescens* (L.)

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Abstract: *Perilla frutescens* (L.) Britton, is an annual medicinal, aromatic, herbal and functional food plant. *Perilla* origin traces back to East Asian countries including India, China, Japan and other countries, where it has been used as an important source of nutritional and traditional medicinal plant. The leaves, seeds, and stems of *Perilla* are used for various medicinal applications. In this review it has aims to present an overview pertaining to the nutritional and medicinal values of *Perilla*. It has conventionally been used to treat various ailments like anxiety, indigestion, analgesic, asthma, chest stuffiness, vomiting, coughs, colds, flu, phlegm, tumors, allergies, depression-related disease, intoxication, fever, headache, stuffy nose, constipation, abdominal pain and a sedative. The various main uses of *perilla* will be described in this review.

Keywords: *Perilla frutescens*, Nutritional values, Medicinal Importance, Seed oil.




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BIOREMEDIATION OF PESTICIDES BY LACCASES USING RECENT APPROACHES: A REVIEW

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ABSTRACT

Agricultural pesticides and herbicides are highly hazardous, and have tendency to bio-accumulation. Their extensive use to meet increasing demand of food crops has resulted in hazardous environmental pollution problems. Bioremediation plays an important role in pesticide degradation. Soil microorganisms are capable of producing various enzymes, amongst which laccase enzyme has great pesticide degradation potential. The aim of this review is to focus on recent approaches and applications of laccase in pesticide degradation.

KEYWORDS: Laccase, Bioremediation, Application & Agricultural

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INTRODUCTION

A wide range of agro-chemicals have been used in developing countries to sustain the food productivity essential for feeding the ever growing population. These agro chemicals, mostly pesticides are used to control pest attacks[1]. In many cases, these compounds are observed to be persistent in nature. On the whole it has been observed that the rapid increase in the use of these chemicals have caused considerable damage to the environment [2].

Pesticides have been consistently used for decades with the aim to prevent and reduce pest infestation, safeguard crop yield and maintain the quality of the agricultural produce. The use of pesticides in large scale farming has resulted in a tremendous growth in crop production and in the reduction of vector borne diseases. For example in 1948-49 food grain production was only 50 million tons that has increased to almost fourfold by the end of 1995-97 to 195 million tons from an estimated 149 million hectares of cropped land. The rise in food grain production was because of field application of pesticides, by using high yield varieties of seeds and improved irrigation infrastructure [3]. Similarly an impressive increase in crop yields has been observed in the United States during the twentieth century[4]. On the other hand a considerable amount of applied pesticides fail to reach their desired targets due to their leaching, degradation and volatilization and thus results in serious environmental problems [5]. Although pesticides are useful in containing the pest multiplication and growth, their constant and unregulated application can adversely affect human health, and the entire eco system. Pesticides pose a serious health risk to living organisms on account of their rapid fat solubility and bio-accumulation in non-target organisms[6].

To overcome the above mentioned problems of pesticide application, technologies for pesticide removal in a safe, systematic and economical manner need to be developed and adopted[7]. The existent technologies employ



ANTIOXIDANT PROPERTIES OF SILVER NANOPARTICLES AND METHANOL EXTRACT OF *CINNAMOMUM VERUM* BARK

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Abstract: This study was aimed at synthesizing silver nanoparticles of *Cinnamomum verum* and find their antioxidant properties in comparison with the Methanol extract. FTIR spectral measurements were carried out at a resolution of 4 cm^{-1} to identify the potential functional groups of biomolecules in the *Cinnamomum verum* extracts. The spectral analysis revealed presence of compounds such as flavonoids, phenols, terpenoids, and proteins, and could confirm that these biomolecules in the *Cinnamomum* were responsible for reducing, capping, and stabilizing of the AgNPs. The antioxidant activity of synthesized AgNPs was evaluated by DPPH and reducing power assay, L- ascorbic acid was used as a positive control. The antioxidant activity using DPPH showed Cinna. methanol higher antioxidative than the AgNP, at $500\mu\text{g/ml}$ and the reducing power of Cinna. AgNPs was evaluated to be higher than the Cinna methanol. Thus, the AgNPs synthesized from *Cinnamomum* could be promising candidates for use in nano medicine and beneficial in the nutraceutical industries.

Keyword: Silver Nanoparticles (AgNPs), Fourier Transform Infrared (FTIR), *Cinnamomum* (Cinna.), 2, 2-diphenyl-1-picryl-hydrazyl radical scavenging (DPPH), Silver Nitrate (AgNO_3)

Introduction

Cinnamomum verum, called true cinnamon tree or Ceylon cinnamon tree, is a small evergreen tree belonging to the family *Lauraceae*, native to Sri Lanka and Southern parts of India. The inner bark of several other *Cinnamomum* species is also used to make cinnamon, but *C. verum* has a subtler flavor that makes it preferred for certain recipes as spice (Adewole *et al.*, 2013). They have been therefore used as food additives. They improve the flavor, taste and color of food, as well as extending the shelf life of food by inhibiting the growth or decreases the food borne pathogens. Spices are known to be natural antimicrobials which have found relevance in the preservation of foods. Therefore, cinnamon, garlic, ginger, mint, etc. are used as substitute in health remedies.

Most spices show antioxidant and antimicrobial activity against bacteria, yeasts, and molds. The biological activity of spices is based on the phenolic compounds, so can be effectively applied as food preservatives. Spices can be classified according to their antioxidant and antimicrobial activities into three categories; the first classified as strong (cinnamon, clove, mustard), the second as medium (all spices, sage, bay leaf, caraway, coriander, cumin, rosemary, thyme, oregano), and the third as weak (black pepper, red pepper, ginger) Tarik *et al.*, 2016.

Nanotechnology is an emerging field, which utilizes nanoparticles (NPs) in various applications such as in food packaging, as preservatives, in cosmetics, as carriers of therapeutic agents in nanomedicine (Shalaby *et al.*, 2015; Al Sammarraie *et al.*, 2018). The biosynthesis of nanoparticles has received increasing importance in the last decade due to societal demand to develop environmentally friendly



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Phytochemical Evaluation, Antibacterial and Antifungal Activity of Rauvolfia Tetraphylla L.

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Abstract

Rauvolfia tetraphylla L., like most other plants contain various secondary metabolites with great potentials. The present study aimed at evaluating the phytochemicals by using quantitative and qualitative analysis of ethanol, methanol and aqueous extracts with the help of standard techniques. The findings from quantification and phytochemical screening showed the presence of alkaloids, flavonoids, carbohydrates, phenols, saponins, tannins, quinones and terpenoids. Further, the quantitative analysis results revealed that ethanolic extract of roots was found to have more constituents when compared with other extracts. The antimicrobial activity of aqueous, methanol and ethanol extracts obtained from *Rauvolfia tetraphylla* roots were tested against bacterial and fungal species by agar well diffusion method. Better antimicrobial activity was observed when the methanol extract showed maximum activity against *Staphylococcus aureus* followed by *Bacillus subtilis*. It was observed that methanol extract showed the highest antimicrobial activity against multi drug resistance *S. aureus* at 100 mg/ml concentration, while *E. coli* and *K. pneumoniae* were most susceptible to all extracts. In particular, the results obtained in the present study revealed that *Rauvolfia tetraphylla* root extract can be recommended for the control of infectious Gram positive bacteria. Among different fungi tested *A. flavus* and *C. capsici* were found to be more sensitive to the ethanol extract when compared to others.

Keywords: *Rauvolfia tetraphylla*, phytochemicals, antimicrobial activity.

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I. Introduction

The plant *Rauvolfia tetraphylla* L. (syn. *R. tomentosa* Jacq.) belongs to the family Apocynaceae, and is native to Mexico, Central America, West Indies and northern South America and distributed throughout the tropics including India [1, 2]. In most of the moist and hotter regions of India, the species is seen frequently seen under cultivation and often observed as an escaped plant.

Family Apocynaceae is one of the frequently used angiosperm members as medicine in different Indian systems of medicine. At present, the genus *Rauvolfia* is represented by 77 species distributed in the world and known to contain various unique active phytochemicals in the form of flavonoids, phytosterols, cleoresins, steroids, tannins and alkaloids [3, 4, 5]. The plant is well known for its rich bioactive phyto-chemicals, especially alkaloids. *R. serpentina* (also known as Indian snakeroot or sarapagandha) and *R. tetraphylla* (also known as devil root or Bara Chandrika) are two very important distinctive medicinal shrubs growing in India having wide application in traditional system of medicine for curing human disease and various herbal formulations available in market using these plants [6]. The *Rauvolfia tetraphylla* plant is very similar to *Rauvolfia serpentina*, but the branches are harder. (Figure 1).




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Studies on Nutritional and Medicinal Values of *Perilla frutescens* (L.)

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Abstract

Perilla frutescens (L.) Britton, is an annual medicinal, aromatic, herbal and functional food plant. Perilla origin traces back to East Asian countries including India, China, Japan and other countries, where it has been used as an important source of nutritional and traditional medicinal plant. The leaves, seeds, and stems of Perilla are used for various medicinal applications. In this review it has aims to present an overview pertaining to the nutritional and medicinal values of Perilla. It has conventionally been used to treat various ailments like anxiety, indigestion, analgesic, asthma, chest stuffiness, vomiting, coughs, colds, flu, phlegm, tumors, allergies, depression-related disease, intoxication, fever, headache, stuffy nose, constipation, abdominal pain and a sedative. The various main uses of perilla will be described in this review.

Keywords: *Perilla frutescens*, Nutritional values, Medicinal Importance, Seed oil.

Introduction:

Perilla, [*Perilla frutescens* (L.) Britton], is an annual herbal medicinal, aromatic and edible plant that belongs to the mint family, Lamiaceae, which grows mainly in Asia and is native to the mountainous areas of China and India¹.

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Section A: Green Chemistry



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Purification and characterization of Laccase from a novel chlorpyrifos degrading bacterium from pesticide contaminated agricultural soil

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Abstract: Chlorpyrifos is one of the most widely used organophosphorus insecticides and the deleterious effects like neurotoxicity, genotoxicity of chlorpyrifos to humans, animals and aquatic life have caused much public concern. It is thus essential to develop bioremediation method to degrade and eliminate this pollutant from soil using enzyme systems such as laccases. A novel laccase producing chlorpyrifos degrading strain was isolated and identified by 16S rDNA gene analysis as *Bacillus massiliosenegalensis*. This strain utilized 50 mgL⁻¹ of chlorpyrifos as the sole carbon source and tolerated 100 mg L⁻¹ under optimum cultural conditions of temperature 30°C and pH 7. Under optimum conditions, *Bacillus massiliosenegalensis* metabolized the supplemented chlorpyrifos to 69% within 10 days of incubation. However, with chlorpyrifos 100 mgL⁻¹ the degradation percentage was 42%. Laccase produced by *Bacillus massiliosenegalensis* showed potential chlorpyrifos degradation ability. The laccase enzyme was partially purified by ion exchange chromatography with purification fold of 4.1 and specific activity of 62.54 Umg⁻¹. The enzyme was found



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Fermentation of banana juice using grape fruit juice inoculum

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Abstract

Present study was performed to investigate the effect of white grape must (WGM) and red grape must (RGM) inoculum on fermentation of banana wine. The banana must was prepared from pulp of ripe banana fruits. Pectinase enzyme and potassium metabisulphite (KMS) were added to the juice. Then it was chaptalized to 19°Brix. Diammonium phosphate (DAP) was added to this and pH adjusted to 3.5. The inoculum of WGM and RGM were used at a concentration of 10% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20 °C for about 22 days. Physico-chemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using WGM and RGM had °Brix (6.1), alcohol (4.3% and 4.24%) and titratable acidity (0.93 and 0.88%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different grape must inoculums.

Keywords: Banana must, banana wine, volatile acids, red grape must and white grape must

Introduction

Wine is a fermentation product included in alcoholic beverage category and is produced by fermentation of fruit juice. The fruit having good amount of sugar can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, banana, pineapple, orange, coconut, mango and strawberry wine (Reddy *et al.*, 2012; Shweta *et al.*, 2016; and Ranjitha *et al.*, 2015) [1], [2]. Beside high production of banana fruit, its post harvest losses are more because of its perishable nature. Thus production of banana wine is one the alternative to prevent the postharvest losses of banana fruits. For this appropriate yeast inoculum should be used. Grape fruits are the most common substrates for the production of fruit wine either by using wild yeast present on the fruits or by adding suitable yeast starter. The fruit itself has plenty of fermenting normal flora which is used for production of wine. Thus we can employ grape fruits as a direct source of fermenting yeasts.

Various reports on production of banana wine are increasing (Omwuka and Awam, 2001; Akubor *et al.*, 2003; Cheirsilp and Umsakul, 2008; and Isitua and Ibeh, 2010) [3], [4]. However as per our knowledge very less work is reported in India which focuses on fermentation of banana wine by using grape juice inoculum as well as on volatile acid analysis of such wines. With respect to this here we have made an attempt to investigate the effect of fermentation of banana wine by using grape juice inoculum on physicochemical parameters and volatile acid in banana wine.

Material and methods

Preparation of banana must

Ripe banana fruits were procured from local market of Nanded, Maharashtra, India. These fruits washed with tap water, hand peeled, cut in to thin slices and then grind in mixer. This pulp homogenate was then mixed with water in 1:1 proportion. To this 0.02% of pectinase enzyme to reduce the viscosity and 100 mg/L potassium metabisulphite (KMS), to kill the unwanted microorganisms, were added and the mixture was held at room temperature for 4 h. Pectinase treated juice was then chaptalized to 19°Brix using table sugar, DAP at a concentration of 500 mg/L was added to this and its pH was adjusted to 3.5 using citric acid and calcium carbonate. Then it was kept at 10 °C until required.

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EFFECT OF CHLOROTHALONYL AND MANCOZEB ON GROWTH OF *AUREOBASIDIUM PULLULANS* (DE BARY) G. ARNAUD.

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ABSTRACT

Aureobasidium pullulans (De Bary) G. Arnoud is a ubiquitous, polymorph and oligotrophic black yeast-like phylloplane microfungus that occurs frequently in wide range of tropical and temperate environments. This fungus is agronomical important because it protects leaf surfaces from the infection of other pathogenic fun therefore it is considered as ecofriendly phylloplane yeast. In the present investigation order to know the effect of fungicides on the growth of this beneficial fungus, two cont fungicides namely chlorothalonyl and mancozeb were tested against four isolates *Aureobasidium pullulans* which were isolated from phylloplane surfaces. Among isolate no III and IV were found to be more sensitive chlorothalonyl as compared to I & II. Similarly isolate no IV were found to be more susceptible to mancozeb followed isolate III, II and I. The MIC value of chlorothalonyl for the isolate III and IV were found to be 160 ppm followed by 360 ppm for isolate no I and II. The MIC value of mancozeb for isolate no IV were reported to be 120 ppm followed by 160 ppm for III & 400 ppm for isolate I and II.

Key Words: *Aureobasidium pullulans*, Chlorothalonyl, Mancozeb.




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HPTLC profiling of two ethno medicinally important species of *Calatropis*

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ABSTRACT

Calatropis is one of the common and ethnomedicinally most important genus belonging to family Asclepiadaceae. Two species of *Calatropis* namely *Calatropis procera* and *Calatropis gigantea* are found in India. In the present investigation root, stem and leaf extracts of both the species were compared using HPTLC. The densitometric analysis showed slight difference in the fingerprints of both the medicinal species. Rf values and peaks of densitogram also showed chemical variation. Therefore HPTLC fingerprint analysis carried out in the absence of any standard was found to be informative enough to identify and to evaluate phytochemical variations present in between these two species.

Key words: Asclepiadaceae, *Calatropis*, HPTLC.

INTRODUCTION

Calatropis is small genus of about 6 species of shrubs or small trees distributed tropical and subtropical Africa, Asia and Central America. In India only two species of *Calatropis* namely *Calatropis procera* and *Calatropis gigantea* have been reported so far. Both the species closely resembles each other in structure and find similar uses (Kirtikar et al., 1994). The *Calatropis procera* is commonly having purple flower whereas *Calatropis gigantea* has white coloured flowers. The main physical difference in both the species is floral colour, therefore it is hard to recognize the species without flowering, for identification certain chemical parameters needs to be used (Verma, 2013).

Medicinal plants are said to be backbone of traditional remedy. The traditional medicines related to treatment of both human and animal diseases with plant derived preparations is providing valuable knowledge for treatment (Nwosu and Okfor, 1995). Traditional literature contains large number of medicinal plants including *Calatropis* that can be used against various diseases. *Calatropis gigantea* can be used against diseases like diabetes, atherosclerosis, ischemic heart diseases, disorders induced by free radicals and other reactive oxygen species (Chandrabhan et al., 2011).



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Phytochemical investigation and antimicrobial activity of *Asparagus racemosus* Willd root against some pyogenic bacteria

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Abstract

Asparagus racemosus Willd belongs to family Asparagaceae is a common medicinal plant found in hilly and plain regions of India. The plant has got immense medicinal properties and because of that it has got special importance in ayurvedic system of medicine. In the present investigation attempts were made for study of phytochemical and antibacterial activity of ethanolic extract of root. The study showed presence of primary phytochemicals like steroids, alkaloids, saponins, carbohydrates, flavonoids, amino acids except tannins. Chromatographic analysis (HPTLC) showed presence of seven polyvalent phytochemical compounds with variable R_f values and concentration. The antimicrobial study of extract showed significant growth inhibition against *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Streptococcus pyogenes*, *Streptococcus pneumoniae* and *Pseudomonas aeruginosa*. The mixture of polyvalent compounds present in the extracts might be responsible for the antibacterial activity against the pyogenic bacteria. The results obtained support the application of *Asparagus racemosus* in several traditional ethnomedicinal applications. Furthermore HPTLC fingerprint developed may find its application in the correct taxonomical identification of *Asparagus racemosus* and in detecting adulterations in the crude plant drug.

Keywords: *Asparagus racemosus*, HPTLC, pyogenic bacteria

Introduction

Medicinally important plants present around us are of great importance in primary healthcare of individual and society in many developing countries (Vasundra and Divya, 2013) [1]. It is said that medicinal plants are nature's gift to human being to make life disease free and healthy. In present scenario world health organization is taking official interest in this to develop traditional system of healthcare where special attention has been given on folk medicine as safety for microbial and non-microbial diseases (WHO, 1978) [2]. Herbal medicines are the major remedy for thousands of years and have made great contribution to maintain human health in many parts of the world in the rural areas of developing countries as primary source (WHO, 1993) [3]. This genus has recently placed in family Asparagaceae from Liliaceae (Madhavan, et. al. 2010) [4]. *Asparagus racemosus* Willd is an important medicinal plant of tropical and subtropical countries like India (Gumase and Sherkhane, 2010) [5]. Now a day's substantial number of drugs are being developed from plants which are active against number of diseases. The majority of these involve the isolation of the active ingredients found in a particular medicinal plant and its subsequent modification. In the developing countries 25 percent of medicinal drugs are based on plants and their derivatives and the use of medicinal plants is well known among the indigenous peoples of many developing countries (Vasundra and Divya 2013) [1].

In Indian system of medicine *Asparagus racemosus* is an important medicinal plant. Its root paste or root juice has been used in various ailments and as health tonic (Kirtikar and Basu, 1975; Goyal, et. al. 2003) [6, 7]. *A. racemosus* is used to prevent ageing, increase longevity, impart immunity, improve mental function, nervous disorders, dyspepsia, tumours, inflammation, neuropathy and hematopathy (Sharma and Chamka, 2001) [8]. Review of literature showed that the root extract of *A. racemosus* has anti-ulcer activity (Sairam, et. al. 2003) [9], antioxidant, anti-diarrhoeal, antidiabetic, and immunomodulatory activities (Kamat, et. al. 2000) [10]. A study of ancient classical Ayurvedic literature claimed several therapeutic attributes for the root of *A. racemosus* and has been specially recommended in case of threatened abortion and as a galactagogue (Mishra and Verma, 2017) [11].

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21. Estimation of Quercetin from Different Varieties of Capsicum Annuum L. by using HPTLC Fingerprinting Method

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D. M. Jadhav
S. K. Umate
A. H. Jadhav

Abstract

HPTLC method was developed for the estimation of Quercetin from methanol extract of five different varieties of *Capsicum annuum* L. an important agricultural crop plant cultivated for its fruit as vital part of condiment in indigenous food preparations. Preloaded silica gel GF₂₅₄ is used as stationary phase and mobile phase used is Ethyl acetate: Formic acid: Glacial Acetic acid: Water [10:0.5:0.5:1.3, V/V/V/V]. Detection and quantification were performed densitometrically at wavelength λ 254. The R_f value of standard Quercetin was found to be 0.98. The total peak area percentage of the Quercetin corresponding to standard Quercetin for extract of five different varieties A,B,C,D,E of chilli were compared and the peak area percentage for Quercetin content was estimated to be 17.33%, 17.29%, 26.46%, 19.30%, 29.60% respectively.

Keywords: Agriculture Crop plant, Condiment, HPTLC, Quercetin. Etc.,

Introduction

Natural products from plant, animal and minerals have been the basis of the treatment of human disease. About 500 plants with medicinal use are mentioned in ancient literature and around 800 plants have been used in indigenous systems of medicine [1, 2]. *Capsicum annuum* Linn. belonging to the family of Solanaceae is cultivated in almost all the tropical countries. In Ayurvedic medicine *C. annuum* is classified as follows [3]:

Classification:

Kingdom-Plantae
Division- Magnoliophyta
Class- Magnoliopsida





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Preliminary Phytochemical Investigation and HPTLC studies on two species of *Ocimum*

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Abstract

Ocimum is one of the important genus of the Lamiaceae comprising aromatic annual or perennial herbs and shrubs. The genus is reported from tropical and warm temperate region of the world. More than 150 species of this genus has been reported from all over the world. In the present investigation ethanolic extracts of two species of *Ocimum* i.e. *Ocimum sanctum* (*tenuiflorum*) and *Ocimum gratissimum* were evaluated for preliminary phytochemical and HPTLC analysis. The main objective of the present work is to find out various Phytochemical compounds in both the species and to compare HPTLC chromatograms of root, stem and leaves for knowing similarities and differences of phytochemical constituent to get chemotaxonomic data. Results of Phytochemical analysis of leaves *O. tenuiflorum* and *O. gratissimum* showed more or less similar type of compounds including Amino Acids, Alkaloids, Flavonoids, Glycosides, Phenolics and Tannins in both species. In the present work HPTLC results of root, stem and leaf extracts were compared. The densitometric analysis showed slight difference in the finger prints of the both the species of *Ocimum*. The numbers of phytochemicals presented in leaf samples of both species were similar. The HPTLC data of root and stem extracts of both the species has shown minor variations in the Rf values and peaks of densitogram. Therefore HPTLC analysis carried out in the absence of any standard was found to informative enough to identify and evaluate phytochemical variation present in between these two species.

Keywords: Lamiaceae, *Ocimum*, HPTLC.

Introduction

Medicinal plants are widely used for treatment of different types of diseases since ancient times. Different parts of the plants such as root, stem, leaves, seed and sometime whole plant are known to have therapeutic applications. (Prakash and Gupta, 2005). Medicinal plants have been used as preservatives in pharmaceuticals and natural therapies. There is great demand for medicinally



HPTLC Profiling and Antimicrobial Studies of Some Commonly Used Indian Spices

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ABSTRACT

Indian medicinal system is one of the most believable and traditional system of medicine in the world where we find importance of spices and condiments in daily life. Spices have been in use as food additives since ancient times. They are used as flavoring agent and also as preservatives. Most of the spices are indigenous in origin with characteristic aroma and strong taste. These spices not only add flavor to dishes but also they have lots of medicinal properties. By considering their polyvalent significance in present investigation we have made an attempt to study antimicrobial potential and HPTLC profiling of *Curcuma longa*, *Cinnamomum verum*, *Cuminum cyminum*, *Piper nigrum*. Chromatographic analysis (HPTLC) showed presence of several phytochemical compounds with variable R_f values and concentration. The antibacterial activity showed significant growth inhibition against *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Streptococcus pyogenes*, and *Streptococcus pneumoniae*. The mixture of phytochemical compounds present in the extracts might be responsible for the antibacterial activity against these bacteria. The results obtained support the application of these spices in several traditional ethnomedicinal applications. Furthermore, HPTLC fingerprint developed may be useful in the correct identification of these spices and in detecting adulterations in preparation of commercial spice packets.

Key Words: HPTLC, Antimicrobial Activity, Spices.

I. INTRODUCTION

Forest resources have been a valuable source of natural products for a long period of time to maintain human health, especially with more intensive studies in the last decade for natural therapies (Gislene et al., 2000). Spices and herbs have been long used for thousands of centuries by many cultures to enhance the flavor and aroma of foods. Early cultures also recognized the value of using spices and herbs in preserving foods and for their medicinal value. Scientific experiments since the last 19th century have documented the antimicrobial properties of some spices, herbs and their components (Shelef, 1983; Zaika, 1988). The spices used in Indian cooking have been used since ages for adding flavor and also for house-hold treatment of infectious diseases. It is imperative to study their antimicrobial activity against the common

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Fermentation of Banana Must Using Mango Fruit Inoculums

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ABSTRACT

Wine was prepared from eight different varieties of banana (Khozikodu, Karpurchakra keli, Palaykondan, Alpan, Pisang celyan, Lamby, Karpurvalli and Ardhapuri). Alcohol% of the wines produced using different varieties of banana were found to be in the range of 4.34 to 7.89. Highest Alcohol % observed was 7.89% in wine produced using ardhapuri variety. The Ardhapuri variety in which more alcohol production was found was used as reference in this study. This study was performed to investigate the effect of mango fruit must inoculum on fermentation of banana wine. The banana must was prepared from pulp of ripe banana fruits of Ardhapuri variety. Pectinase enzyme and potassium metabisulphite (KMS) were added to the juice. Then it was chaptalized to 19°Brix. Diammonium phosphate (DAP) was added to this and pH adjusted to 3.5. The inoculum of banana juice and mango juice was used at a concentration of 10% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20°C for about 22 days. Physicochemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using banana juice and mango juice inoculum had °Brix (6.1 and 6.5), alcohol (4.38 and 4.24%) and titratable acidity (0.93 and 0.83%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different must inoculums.

Keywords: Banana must, banana wine, volatile acids, mango must

1. INTRODUCTION

Banana is one of the most important economic fruit crops. Because of high moisture content and textural characteristics, It is highly perishable in nature. By adopting proper post harvest management practices and processing into value added products, Post harvest losses of banana can be reduced. Banana wine is a nutritious alcoholic beverage with low alcohol content. The cost of production of banana based alcoholic beverages is much cheaper than other fruit based beverages.

Banana fruit is having good amount of sugar which can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, grape, banana, pineapple, orange, coconut, mango and strawberry wine (Reddy et al., 2012; Shweta et al., 2016; and Ranjitha et al., 2015). Mango fruits are also one of the the most common substrates for the production of fruit wine either by using

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Phytochemical and Ethnobotanical studies of some medicinally important *Ocimum* sps from Kinwat and Mahur Region of Maharashtra.

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Abstract

Ocimum sanctum also known as Tulsi or Holy basil is an aromatic plant and it belongs to the family Lamiaceae. It is widely used as medicine to cure various ailments. The proposed paper aims at the scientific study of the ethno medicinal survey, of some of the medicinally important *Ocimum* Genus such as *Ocimum tenuiflorum*, *O. gratissimum*, *O. basilicum* and *O. americanum* carried out during the month of August to November in 2019. The focal point of this survey was to do the Ethnobotanical study of some of the medicinal plants of *Ocimum* Genus used by local villagers in the region of Kinwat and Mahur region of Maharashtra. Further they were analysed for different Phytochemical components from the different species *Ocimum* genus. The dried powder of Tulsi (20g) was placed in the thimble of Soxhlet apparatus and the experiment was done separately for methanol, ethanol and distilled water.

Keywords: Phytochemical, Ethnobotanical survey, *Ocimum* sp. soxhlet apparatus. Etc.

INTRODUCTION

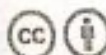
In India, 68 species of *Ocimum* are found out of total 150 reported species of the world till date. Plants belonging to Lamiaceae are effective source of traditional and modern medicines, useful for primary health care. *Ocimum sanctum* L. commonly known as holy basil (Tulsi) is an herbaceous perennial, belongs to family Lamiaceae and is considered as one of the most important source of medicine and drugs with many secondary metabolites and essential oils recommended for treatment of malaria, diarrhoea, bronchial asthma, dysentery, bronchitis, skin diseases, arthritis, painful eye diseases, chronic fever and eye diseases etc. (Bohan et. al. 1994 and Bonjar 2004) In addition, *Ocimum sanctum* also shows anticancerous, antifungal, antimicrobial, antifertility, hepatoprotective, antispasmodic, cardio protective, antiemetic, antidiabetic and so many very important medicinally properties. The pharmacological studies reported in the present research confirm the therapeutic value of *O. Sanctum*. Therefore, the present study looks into the Ethnobotanical survey, extraction and preliminary Phytochemical analysis of four *Ocimum* genus such as *Ocimum* sp. i.e. *Ocimum tenuiflorum*



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HPTLC profiling and antimicrobial studies on *Curcuma aromatica* Salisb and *Madhuca longifolia* (Koenig).

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ABSTRACT

Curcuma aromatica and *Madhuca longifolia* are the medicinal plants commonly used by the tribal peoples of Kinwat and Mahur forest range for the treatments of various ailments. In the present investigation these plants were tested for antimicrobial activities and found that, they have considerable antibacterial potential against tested bacteria. HPTLC analysis of rhizome and flower of both the medicinal plants showed different phytochemical compounds with variable RF values and concentration. *C. aromatica* rhizome showed three polyvalent phytochemical compounds with RF value ranging from 0.37 to 0.91. flower extract of *M. longifolia* showed nine compounds with RF value ranging from 0.02 to 0.91. The HPTLC obtained using toluene, ethyl acetate and formic acid in the current study will be very much useful in the correct identification of the drug and can be used for finding out any type of adulterations.

Keywords: *Curcuma aromatica*, *Madhuca longifolia*, HPTLC, Antibacterial.

INTRODUCTION

Medicinally important plants present around us are of great importance in primary healthcare of individual and society in many developing countries. It is said that medicinal plants are nature's gift to human being to make life disease free and healthy (Jadhav, 2018). In present scenario world health organization is taking official interest in this to develop traditional system of healthcare where special attention has been given on folk medicine as safety for microbial and non-microbial diseases (WHO, 1978). Herbal medicines are the major remedy for thousands of years and have made great contribution to maintain human health in many parts of the world in the rural areas of developing countries as primary source (WHO, 1993).





JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

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ETHNOBOTANICAL DOCUMENTATION OF RUBIACEAE FLORA FROM KINWAT REGION OF MAHARASHTRA.

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ABSTRACT

An ethnobotanical survey for collecting information about the uses of medicinal plants belonging to family rubiaceae from Kinwat region was undertaken. Survey was done by collecting information from the experienced ethno medicinal practitioners of this region. An authentic and reliable information about plants and their medicinal uses were collected and documented. From the survey we reported seventeen species of rubiaceae were used for different medicinal purposes by the tribal peoples from Kinwat regions of Nanded District, Maharashtra for treating and curing ailments.

Key Words: Rubiaceae, Kinwat forest.

INTRODUCTION

Medicinal plants have played vital role in the traditional system of medicine in the healing of different types of diseases [1] This system of medicine is currently the fastest growing medical field with herbal therapies becoming increasingly popular. Traditional medicine is considered more holistic, acceptable, accessible and low cost and proven to be safe and that is why preferred by local people. The tribal people live and rely on plants and plant products and are using traditional medicine system for centuries. The traditional medicinal practices are an important part of the primary health care system in developing world [2].

From several thousand years plants have been used in traditional medicine. In India thousands of species are known to have medicinal value and the use of different parts of several medicinal plants to cure specific ailments. Plants are the richest resource of drugs of traditional systems of medicine, modern medicine, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs. Local people develops new therapeutic protocols using medicinal plants against certain diseases through their indigenous experiences transferred to them from their ancestors. The rural population especially tribals mostly dependent upon medicinal plants for the treatment of their ailments. This ancient knowledge of use of medicinal plants is really a unique asset that needs to be studied and preserved too. It would help for the welfare of entire mankind. The main aim of the present study is to survey and collect information on plants of family rubiaceae used traditionally by a different tribal community from Kinwat, region of Maharashtra. Kinwat forest is located in northern part of Nanded district. Geographical position of the Kinwat is 19° 25 to 19° 55 N latitude and 77° 51 to 78° 19 E longitude. The total area of land of Kinwat Taluka is 201235 Square Kilometers, out of that 57256 Square Kms covered by forest area which are inhabited by tribal population of aborigines like Andh, Kolam, Gond, Naikede and Pradhan.





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Comparative HPTLC studies on Rhizome of Geographically isolated plants of *Zingiber officinale* Roscoe

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Abstract

The production of phytochemical compounds not only varies between varieties or species but also depends on external variables such as environmental conditions. The environmental condition can affect the phytochemical compositions of plants is the geographical location of growth. The active principles and other constituents of a number of medicinal plants are found to fluctuate with seasons and geographic regions. Therefore, considering same view, in the present work HPTLC chemical fingerprint of rhizome of (*Zingiber officinale* Roscoe) from Nanded district of Maharashtra and of Shimla, Himachal Pradesh were compared for their chromatogram variation. The densitometric analysis showed slight difference in the fingerprints of rhizome from both the locations. Rf values and peaks of densitogram also showed chemical variation. The rhizome of *Z. officinale* from Nanded showed nine phytochemical compounds and that of rhizome from Shimla showed eight compounds. HPTLC fingerprint analysis carried out without any standard was found to be informative enough to identify and to evaluate phytochemical variations present in between these two plants of *Z. officinale*.

Key Words: HPTLC, *Zingiber officinale*.

Introduction

Herbs and spices produce a different type of phytochemicals and secondary metabolites therefore they have been used not only as food preservatives and flavoring agents but also employed as medicine to cure different ailments. Medicinal plants play an important role in traditional health care systems as well as in international herbals and pharmaceutical markets (Talla et. al. 2013). Ginger (*Zingiber officinale* Roscoe) is an important tropical high valued medicinal plant, all across the world as a spice and for its therapeutic properties. It belongs to the family Zingiberaceae, which contains about 1300 species in 50 genera, along with four other families is positioned in the order Zingiberales which belong to class Monocotyledons (Ashraf et. al. 2017). The ginger is cultivated all over the world for its important rhizomes. Rhizome has lot of important medicinal properties. In Chinese, Ayurvedic, and Unani systems of medicine it is widely used in the treatment of ailments like arthritis, rheumatism, sprains, muscular aches, pains, sore throats, cramps, fever, infectious diseases and helminthiasis (Mustafa and Srivastava 1990). Rhizome of ginger can be used in majority of house hold remedies. It contains a number of different pungent and biologically active compounds mainly 6-gingerol, 10-gingerol, 8-gingerol, 6-shogaol, zingerone and paradol (Govindarajan, 1982). This different types of phytochemicals in ginger has known to possess antimicrobial and antifungal properties as well as several pharmaceutical properties (Park et. al. 2008). The characteristics phytochemicals produced by spices can be detected and studied by using modern analytical techniques such as spectroscopy, chromatography etc. In the



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ROOT COLONIZATION STUDIES ON TOMATO, BAJRA AND MAIZE BY *GLOMUS MOSSEAE*

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Abstract

A mycorrhizal fungus infects the plant roots to form mutualistic associations, whereby the fungi give nutrients, water and protection to the plant in exchange for food. Mycorrhizal diversity is important to enhance the crop yield and soil fertility. Arbuscular mycorrhizal (AM) fungi are useful to maintain the intimate link between the plant roots and soil. The aim of present work is to grow and pure culture of *Glomus mosseae* on different host plants like Tomato, Maize and Bajara in order to multiply it on mass scale. The experimental results showed that a root of these plants showed positive colonization for *G. mosseae*. The percentage of root colonization in Tomato roots (97%) followed by Bajara (92%) and Maize (76%) were reported. Microscopic observations of root segments showed presence of mycelial fragments, vesicles and arbuscules.

Keywords: Arbuscular mycorrhiza, root colonization, *Glomus mosseae*.

Introduction:

Arbuscular mycorrhizas are the symbiotic association present between the plants and fungi (Frank, 1885). From few decades, Arbuscular mycorrhizal (AM) fungi have emerged as potential biofertilizers, a cheap, environmental friendly alternative to expensive chemical fertilizers (Srivastava *et al.*, 1996). This root-fungus association is mutualistic and is being considered as a functionally distinct which is involved in mineral nutrient uptake from the soil (Kar, 1993). The work on survey, isolation and identification of arbuscular mycorrhizal fungi is continuously going in different parts of world. Vesicular arbuscular mycorrhizal fungi have the potential to influence the ecosystem processes, it has great potential to determine the plant communities and its ability to induce a wide variety of growth responses in coexisting plant



STUDIES ON BIOLOGICAL CONTROL OF *FUSARIUM OXYSPORUM* FORM SP. *CICRI*

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ABSTRACT

The aim of present investigation was to assess severity of Fusarial wilt of chickpea in Nanded District of Maharashtra state, India and to develop an effective and ecofriendly seed dresser to control it. Frequent visits were made to collect the diseased plants along with soil samples from chickpea growing regions of Nanded, District during January-February, 2020. The pathogen was isolated from the diseased samples and pure culture were obtained using Coon's medium. The effect of different plant extracts on the growth of pathogen was studied *in vitro*. Similarly, antagonistic fungi like *Trichoderma viride*, *Rhizopus stolonifer*, *Aureobasidium pullulans* and *Aspergillus* species were screened against the pathogen, *Fusarium oxysporum* f. sp. *ciceri*. From the results obtained during this study it was concluded that maximum disease incidences occurred in Ardhapur, Mukhed and Hadgaon blocks (Talukas). The aqueous and alcoholic plant extracts of *Azadirachta indica* and *Curcuma longa* showed maximum inhibition in the growth of the pathogen. It is also evident that the antagonists like *Trichoderma viride*, *Rhizopus stolonifer*, *Aureobasidium pullulans*, and some species of *Aspergillus* were found to be inhibitory against *F. oxysporum* f sp. *ciceri*. Seed treatment with the leaves of Neem and *Ipomea* were found to be more inhibitory to the pathogen.

Key words: Biological control, *Cicer arietinum*.

Introduction:

Chickpea (*Cicer arietinum* L.), an important pulse crop grown in Marathwada region, often suffers from *Fusarium* wilt. It is one of the serious soil borne diseases of chickpea, caused by *Fusarium oxysporum* f. sp. *ciceri*. Biological control of this disease, using bio-pesticides, micro-organisms and plant derived Botanicals offers powerful alternative to the synthetic and often hazardous chemicals

Materials and Methods:

Frequent field visits were made to all chickpea growing fields of Nanded District during January-February 2020, to observe incidence of wilt disease in the field. The

infected plant materials and soil samples were collected and brought to the laboratory for further studies.

The pathogen was isolated by using *Fusarium* specific Coon's medium (Rangaswami and Mahadevan, 2005), comprising of Sucrose-7.20 gm; Dextrose-3.60 gm; Magnesium Sulphate-1.23 gm; Potassium diphosphate- 2.72 gm; Potassium Nitrate- 2.02 gm; Agar-15 gm; Water 1000 ml; at pH-6.5. The medium was sterilized in an autoclave at 15 lbs pressure and 121° C temperature for 15 min. The autoclaved medium (20 ml) was distributed in 90 mm pre-sterilized petriplates.

The infected plant material (stem) was cut into small pieces and these pieces were placed aseptically on coon's medium. The plates were incubated for seven days and the




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STUDIES ON ARBUSCULAR MYCORRHIZAL FUNGI FROM SOIL OF SITAKHANDI FOREST OF MAHARASHTRA

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ABSTRACT

Forest ecosystems are the regions where there is least human interference and therefore we see luxury of plant growth. Sitakhandi forest is one of the least human interfered forests present near Bhokar region of Nanded district in Maharashtra. Arbuscular mycorrhizal fungi (AM fungi) develops symbiotic relation with most of the land plants. This association is very common in the terrestrial ecosystem throughout the world. The objective of the current study is to identify and determine frequency of various AM fungal species. Five GPS marked sampling sites were selected for isolation of mycorrhizal spores. A total 34 species belonging to genera *Glomus*, *Acaulopora*, *Scutellopora*, *Gigaspora*, *Diversispora*, *Entrophora* and *Pascipora* were reported. Little variation is seen in their frequency. In this study, more species diversity among *Glomus* followed by *Acaulopora* were found. High frequency percentage of *Glomus mosseae* has been reported at all study sites.

Keywords: Mycorrhiza, *Glomus*, *Acaulopora*, Sitakhandi forest.

1. INTRODUCTION

Symbiotic Arbuscular Mycorrhizal Fungi (AM fungi) forms an extensive hyphal network for providing water and nutrients to living plants [1]. These symbionts are most commonly found in large majority of terrestrial plants [2]. The AM fungi belong to phylum Glomeromycota which forms main component of soil mycoflora. From the past three decades, this group of soil mycoflora have drawn the attention of researchers because of their ability to form intimate association with 70 to 90% of plant species [3]. In addition to nutrient uptake, this association is involved in protection against soil borne pathogens and improvement of soil fertility and stability. Their detection and studying diversity in soil is very essential for any agro-ecosystem [4]. Approximately, 150 AM fungi have been described by means of morphological characteristics of spores [5]. Because of their wide presence in soil, it is believed to contribute significantly to global phosphate and carbon cycle and influences primary productivity in terrestrial ecosystem [6]. Establishment of such mutualistic relationship can stimulate, activation of antioxidant, phenylpropanoid and carotenoid pathways [7]. Synthesis of plant secondary metabolite which are important for increased plant

tolerance to abiotic and biotic stress are beneficial to human health through their antioxidant activity [8]. These obligate symbionts are not host specific and one species may found to be associated with various plants in the same locality [9] and also one host plant can support mixed population of AM fungal species [10]. Sitakhandi forest is about 39 km away from Nanded and Bhokar respectively. It is divided in to minor south and major north region by a middle road. The forest cover is approximately 7.0 km². It is dominated by plant like Teak (*Tectona grandis* L) and also consists of various types of herbs and grasses. The vegetation of forest comes under the category of dry deciduous type. Since this forest has thick plant cover therefore we observe least interference from human. Therefore, we have undertaken this study.

2. MATERIAL AND METHODS

2.1. Collection of Soil Samples

For the present work, rhizosporic soil samples were collected from Sitakhandi forest. Samples were collected in the month of June-21 from five different sites. The geographic locations of sites are shown in the Fig 1. Sampling sites are named as S-1 (19° 14' 18" N and

Ethnobotanical documentation of some important plants of family Rubiaceae

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Abstract: Ethno-botany is the study of correlation between folks and plants for their use as remedies, food, shelter, attire, firewood, fodder and other household purpose. Ethnobotany deals with the relations of native plants and the local populations of the area. The purpose of the ethnobotanists is to discover how the plants are used for essential need of mankind, and how medical use of such plants is linked to other features of the plant species. They recognize and assemble the information of valuable plants by the use of anthropological methods. The aim of the present study is to document and know the importance of ethnobotanically important plants from Rubiaceae family from Nanded. Survey was done by giving field visits and collecting information from the experienced ethno medicinal practitioners of this region. In the current study nine plant species are explored to know ethnomedical values of plants. During ethnobotanical survey of family rubiaceae some plants were observed as tree and some were as shrub. According to discussion make with traditional practitioners the plants from this family are used to cure various ailments. The modern study make by some people also correlate the same observation.

Keywords: Rubiaceae, Ethnobotany, Nanded.

Introduction: Plants are very valuable source of a variety of bioactive compounds which have directly or indirectly useful in the healing of various human ailments. Ancient ago, human civilizations have been using various plants and plant products to treat the lethal diseases. Since time long past tribal communities around the world are using plants and their parts as an ethno-remedies for the treatments of various diseases (1). Botanical pesticides or herbal medicines obtained from plants have long been used against microorganisms which causes plant and human diseases (2). Compounds derived from plants have got rising importance all over the world as they acquire effective, nonpoisonous pharmacological compound, financial feasible, safer and more reliable (3). Most of the people of Maharashtra are totally dependent on herbal medicines for their healthcare. Traditional medicine made from plants is commonly accepted and experienced by the villagers, vaidyas, and some other aged people and its knowledge is ethnically forwarded to the next generation. Use of plants as customary medicine is broadly recognized and experienced by the villagers, Vaidya, and some other senior people and the information of it is socially forwarded to the next generations (4).

Material and Methods:

During the study frequent field visits were made to Kinwat and nearby forest areas in the months of January to June 2021. Plant collection was done on the basis of frequently used folk medicines by the Kinwat tribes. The plants were collected from Sahasrakund, Sitakhandi and Kinwat forest. Information presented here is based on special observations and interviews with traditional healers like hakims and old aged people. Ethnobotanical information about collected plants were documented in sense of papers. Plant identification was done by using flora of Maharashtra (5). Collected medicinal plants were dried, mounted on herbarium sheets. The leaves and stem of same plants were collected, dried and prepared fine powder using mechanical grinder which will be used for preparation of extract by soxhlet method for further study. The current study presents following nine plants along its ethnomedical applications.

Gardenia gumifera L. f. -

This plant is collected from Kinwat forest its primary identification was made on field and the identity was confirmed through flora. *G. gumifera* is one of the most important evergreen herbs from family Rubiaceae. Powder of all plant parts are used in bone fracture and displacement on the suffered part as fermentation to diminish pain as well as to improve the corn formation. Gum released from bark and stem is very commonly used to cure toothache and to make germ-free the infected wounds. Gum is also used to save food grains from pest and mites (4). This plant is demanded for having various therapeutic properties owing astringent and caustic properties which are used in the controlling of indigestion and hemorrhoid. The plant is also suitable in the treatment of venery for cleaning obscene sores and wounds. It is also reported that *G. gumifera* is very rich in phytoconstituents (18).

Gardenia jasminoides J. Ellis. -

This plant was collected from Sitakhandi forest. It is an evergreen flowering plant and now a days it is commonly cultivated as ornamental plant. It grows in many temperate regions and having strong fragrant white flowers. It is commonly known as kope jasmine. The bioactive compounds isolated from its fruits were geniposide, genipin, and geniposidic acid. All of these are iridoid glycosides and medicinally very important. Other important phytochemicals obtained from the plant are shanzhiside, scandoside, methyl ester, crocin, crocetin, gardoside, jasmminoside. These plants have various ethnomedical properties that are used to cure jaundice, headache, dropsy, fever, liver diseases, high blood pressure, and stomach inflammation. *G. jasminoides* has various biological activities like antidepressant, antidiabetic, antioxidant, anti-inflammatory and antipyretic as well as used as yellow dyes





Preliminary phytochemistry and Anticancerous Activity of Plants *Neolamarckia cadamba* Roxb. and *Morinda citrifolia* linn. from Rubiaceae family

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Abstract:

The present study was implemented for primary phytochemistry and revealing anticancer effect of leaves and stem of methanolic extract of *Neolamarckia cadamba* and *Morinda citrifolia*. An MTT assay method was used to analyse the number of viable cells using MCF7 cell lines treated with different concentrations of the stem and leaves of methanolic extract of *Neolamarckia cadamba* and *Morinda citrifolia*. A dose dependent growth inhibition of MCF7 cell lines were seen treated with plant extract. As the concentration of extract increases the percentage of viable cells decreases. The investigational outcome proves that the methanolic extract of stem and leaves of *Neolamarckia cadamba* and *Morinda citrifolia* plants from Rubiaceae family showed good anticancerous activity. Preliminary phytochemical screening of the extract showed the presence of alkaloids, triterpenes, tannins, saponins, glycosides, phenolic compounds and flavonoids. Chemical tests were carried out by using standard procedures to identify the preliminary phytochemical screening. The phytochemical test on methanolic extracts of leaves and stem of *Neolamarckia cadamba* and *Morinda citrifolia* showed the presence of various phytoconstituents like alkaloid, carbohydrate, glycoside, steroid, protein, tannin, terpenoid, flavonoid and phenol are present.

Keywords: Phytoconstituents, Tumour, Anticancerous.

Introduction:

Plants have been used for centuries to treat diseases. In various parts of the world, several plants are consumed for their health benefits as a part of traditional folk medicine. The development of cancer registries throughout the world has led to a search for novel drugs that are toxic to the cancer cells while having no harmful effect on normal cells. The anticancer drugs used previously exhibited relatively high toxicity not only to the tumour cells, but also to the normal cells of the body part in which the cancer developed. Currently, the search for novel anticancer drugs is being conducted among terrestrial plants as well as in marine environments (Anna Lichota and Krzysztof Gwozdziński, 2018). One approach is to obtain these substances through extractions from the plant materials. Another approach is to use biotechnological tools





HPTLC profiling and antimicrobial studies on *Curcuma aromatica* Salisb and *Madhuca longifolia* (Koenig).

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ABSTRACT

Curcuma aromatica and *Madhuca longifolia* are the medicinal plants commonly used by the tribal peoples of Kinwat and Mahur forest range for the treatments of various ailments. In the present investigation these plants were tested for antimicrobial activities and found that, they have considerable antibacterial potential against tested bacteria. HPTLC analysis of rhizome and flower of both the medicinal plants showed different phytochemical compounds with variable RF values and concentration. *C. aromatica* rhizome showed three polyvalent phytochemical compounds with RF value ranging from 0.37 to 0.91. flower extract of *M. longifolia* showed nine compounds with RF value ranging from 0.02 to 0.91. The HPTLC obtained using toluene, ethyl acetate and formic acid in the current study will be very much useful in the correct identification of the drug and can be used for finding out any type of adulterations.

Keywords: *Curcuma aromatica*, *Madhuca longifolia*, HPTLC, Antibacterial.

INTRODUCTION

Medicinally important plants present around us are of great importance in primary healthcare of individual and society in many developing countries. It is said that medicinal plants are nature's gift to human being to make life disease free and healthy (Jadhav, 2018). In present scenario world health organization is taking official interest in this to develop traditional system of healthcare where special attention has been given on folk medicine as safety for microbial and non-microbial diseases (WHO, 1978). Herbal medicines are the major remedy for thousands of years and have made great contribution to maintain human health in many parts of the world in the rural areas of developing countries as primary source (WHO, 1993).



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RESEARCH ARTICLE

ETHNOMEDICINAL STUDIES OF SOME MYRTACEAE PLANTS FROM NANDED REGION OF
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Key words:-
Myrtaceae, Ethnomedicine

Abstract

Nanded is one of the most biodiversity rich region of Maharashtra. This area is having deciduous regions known as Kinwat, Mahur and Shitakhandi forest. The regional peoples use many traditional medicines for the treatments of various diseases. The aim of current research is to survey and document ethno-medicinal usages of family Myrtaceae. For this data collection many time field visits were given. All the collected data and information were confirmed using available literature. Total six plants of Myrtaceae were reported in the study. *Syzygium carini* (Jamun), *Psidium guajava* L. (Guava), *Eucalyptus globulus* (Nilgiri) are the common plants reported in survey including *Callistemon citrinus* (Bottle brush), *Syzygium aromaticum* L. (Laong), and *Syzygium jambos* L. The plants reported in the present study were found to be used by local peoples for the treatments of different ailments.

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Introduction:-

Many plants are used as traditional medicine from an ancient period. According to World Health Organization (WHO) traditional medicine has been an integral resource for health since centuries in communities around the world. Herbal medicines are used by many tribal peoples, the biodiversity heritages of herbal drugs are invaluable resources to evolve, inclusive diverse sustainable ecosystem. Ethnomedicine or herbal medicine also stand part of pharmaceutical industries. Over 40% of pharmaceutical formulation are based on natural products and land mark drugs. India has been known for higher ethnobotanical wealth and numerous medicinal plants growing in the different region[1]. The Indian system of medicine is part of our cultural heritage and have cost effective and efficient patient managements throughout the ages[2].

Myrtaceae family is one of the medicinally and economically useful one. Plants belong to this family are distributed world wide. This family is commonly known as myrtle family. It include over 5650 species occurring in some 130-150 genera, almost all species are woody, with essential oils[3]. Myrtaceous plants are abundantly found in Australia, where some Eucalyptus tree are world tallest tree of angiosperms. In India the family is represented by about 15 genera and over 170 species [4].

Many members of this family is used as food and medicine. Myrtaceae is considered as economically important throughout the world like edible fruit of Guava (*Psidium guajava*), Jamun (*Syzygium cumini*), spices such as cloves (dried flower bud of *Syzygium aromaticum*). Cultivated domestically as ornamental bottle brush plants (*Callistemon*

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ETHNOBOTANICAL DOCUMENTATION OF RUBIACEAE FLORA FROM KINWAT REGION OF MAHARASHTRA.

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ABSTRACT

An ethnobotanical survey for collecting information about the uses of medicinal plants belonging to family rubiaceae from Kinwat region was undertaken. Survey was done by collecting information from the experienced ethno medicinal practitioners of this region. An authentic and reliable information about plants and their medicinal uses were collected and documented. From the survey we reported seventeen species of rubiaceae were used for different medicinal purposes by the tribal peoples from Kinwat regions of Nanded District, Maharashtra for treating and curing ailments.

Key Words: Rubiaceae, Kinwat forest.

INTRODUCTION

Medicinal plants have played vital role in the traditional system of medicine in the healing of different types of diseases [1] This system of medicine is currently the fastest growing medical field with herbal therapies becoming increasingly popular. Traditional medicine is considered more holistic, acceptable, accessible and low cost and proven to be safe and that is why preferred by local people. The tribal people live and rely on plants and plant products and are using traditional medicine system for centuries. The traditional medicinal practices are an important part of the primary health care system in developing world [2].

From several thousand years plants have been used in traditional medicine. In India thousands of species are known to have medicinal value and the use of different parts of several medicinal plants to cure specific ailments. Plants are the richest resource of drugs of traditional systems of medicine, modern medicine, food supplements, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs. Local people develops new therapeutic protocols using medicinal plants against certain diseases through their indigenous experiences transferred to them from their ancestors. The rural population especially tribals mostly dependent upon medicinal plants for the treatment of their ailments. This ancient knowledge of use of medicinal plants is really a unique asset that needs to be studied and preserved too. It would help for the welfare of entire mankind. The main aim of the present study is to survey and collect information on plants of family rubiaceae used traditionally by a different tribal community from Kinwat, region of Maharashtra. Kinwat forest is located in northern part of Nanded district. Geographical position of the Kinwat is $19^{\circ} 25'$ to $19^{\circ} 55'$ N latitude and $77^{\circ} 51'$ to $78^{\circ} 19'$ E longitude. The total area of land of Kinwat Taluka is 201235 Square Kilometers, out of that 57256 Square Kms covered by forest area which are inhabited by tribal population of aborigines like Andh, Kolam, Good, Naikede and Pradhan.





RESEARCH ARTICLE

ETHNOMEDICINAL STUDIES OF SOME MYRTACEAE PLANTS FROM NANDED REGION OF
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Introduction:-

Many plants are used as traditional medicine from an ancient period. According to World Health Organization (WHO) traditional medicine has been an integral resources for health since centuries in communities around the world. Herbal medicines are used by many tribal peoples, the biodiversity heritages of herbal drugs are invaluable resources to evolve, inclusive diverse sustainable ecosystem. Ethnomedicine or herbal medicine also stand part of pharmaceutical industries. Over 40% of pharmaceutical formulation are based on natural products and land mark drugs. India has been known for higher ethnobotanical wealth and numerous medicinal plants growing in the different region[1]. The Indian system of medicine is part of our cultural heritage and have cost effective and efficient patient managements throughout the ages[2].


Myrtaceae family is one of the medicinally and economically useful one. Plants belong to this family are distributed world wide. This family is commonly known as myrtle family. It include over 5650 species occurring in some 130-150 genera, almost all species are woody, with essential oils[3]. Myrtaceous plants are abundantly found in Australia, where some Eucalyptus tree are world tallest tree of angiosperms. In India the family is represented by about 15 genera and over 170 species [4].

Many members of this family is used as food and medicine. Myrtaceae is considered as economically important throughout the world like edible fruit of Guava (*Psidium guajava*), Jamun (*Syzygium cumini*), spices such as cloves (dried flower bud of *Syzygium aromaticum*), cultivated domestically as ornamental bottle brush plants (*Collisecton*

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Preliminary phytochemistry and Anticancerous Activity of Plants *Neolamarckia cadamba* Roxb. and *Morinda citrifolia* linn. from Rubiaceae family

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Abstract:

The present study was implemented for primary phytochemistry and revealing anticancer effect of leaves and stem of methanolic extract of *Neolamarckia cadamba* and *Morinda citrifolia*. An MTT assay method was used to analyse the number of viable cells using MCF7 cell lines treated with different concentrations of the stem and leaves of methanolic extract of *Neolamarckia cadamba* and *Morinda citrifolia*. A dose dependent growth inhibition of MCF7 cell lines were seen treated with plant extract. As the concentration of extract increases the percentage of viable cells decreases. The investigational outcome proves that the methanolic extract of stem and leaves of *Neolamarckia cadamba* and *Morinda citrifolia* plants from Rubiaceae family showed good anticancerous activity. Preliminary phytochemical screening of the extract showed the presence of alkaloids, triterpenes, tannins, saponins, glycosides, phenolic compounds and flavonoids. Chemical tests were carried out by using standard procedures to identify the preliminary phytochemical screening. The phytochemical test on methanolic extracts of leaves and stem of *Neolamarckia cadamba* and *Morinda citrifolia* showed the presence of various phytoconstituents like alkaloid, carbohydrate, glycoside, steroid, protein, tannin, terpenoid, flavonoid and phenol are present.

Keywords: Phytoconstituents, Tumour, Anticancerous.

Introduction:

Plants have been used for centuries to treat diseases. In various parts of the world, several plants are consumed for their health benefits as a part of traditional folk medicine. The development of cancer registries throughout the world has led to a search for novel drugs that are toxic to the cancer cells while having no harmful effect on normal cells. The anticancer drugs used previously exhibited relatively high toxicity not only to the tumour cells, but also to the normal cells of the body part in which the cancer developed. Currently, the search for novel anticancer drugs is being conducted among terrestrial plants as well as in marine environments (Anna Lichota and Krzysztof Gwozdziński 2018). One approach is to obtain these substances through extractions from the plant materials. Another approach is to use biotechnological tools to



Pharmacognostic and GC-MS studies on *Psidium guajava* L. (Guava)

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Abstract

The guava is common and major fruits plant, whole plant useful to human. The purpose of current study was identifying the primary phytochemicals and pharmacognostic study of leaves, stem and fruits of guava. Guava plant collected from the Nanded District. The leaves, stem and fruits powder were successively extracted with methanol as a solvent. Soxhlet's extraction methods was used. In the present study of pharmacognostic investigation including morphology of plant, macroscopic, microscopic, fluorescence analysis and physico-chemical studies have been done. In microscopic investigation stomatal index, T. S. of leaves and T. S. of stem were done. In physico-chemical studies including moisture content, swelling index and foaming index were done. Primary phytochemical screening of *P. guajava*, leaf, stem and fruits extract revealed the presence of flavonoids, saponins, alkaloid, triterpenoids, steroid, saponin, glycosides, tannins, anthraquinone, phenol and carbohydrates, while cardiac glycosides, coumarin, glycosides protein and fixed oil, test were absent. The guava fruit extract analysed by gas chromatography coupled with mass spectrometry (GC-MS) and the components of the plant extract were identified. There are twenty three components are identified by GC-MS method. The findings of this study proved that the *P. guajava* plant contain many medicinally important components which regulate the nutritional value to human.

Keywords: Pharmacognostic study, study of guava, *Psidium guajava* L, GC-MS analysis

Introduction

Psidium guajava L. commonly known as Guava. Guava is a most common and major fruit of India used as food and herbal medicine. Guava is growing tropical and sub-tropical region of world. Origin of guava is tropical America. In India guava grow as cultivated crops in many states of country. The plant has many medicinal properties, which is used in folk medicine from the ancient periods (Rukmaji et. al. 2024). *P. guajava* belong to the Myrtaceae family. Plants happen to be serving human beings as a natural source of cure for various ailments and diseases since ages. The world has seen huge increase in plant research in recent times, and numerous evidences show vast potential of medicinal plants used in various traditional medicine (Neelofar Majid et al. 2021) [1]. Medicinal plants are important with respect to new medicine and pharmacological research development. They are widely used and accepted as home medicine and raw materials for the pharmaceutical industry (Garode et al. 2014) [2]. *Psidium guajava* L. commonly known as guava and in Marathi Peru. Guava is used as food and medicine from the ancient period. Guava fruits mainly used for as food in world wide. Guava plants is a native plant of tropical America. The guava grows all tropical and sub-tropical region of world. Guava plant is cultivated all over in India. Most of the farmer grow guava for their fruits. Guava fruits contain many medicinal properties. Most of the guava plants is cultivated in home garden and in farm few plants grow in wild area, near to the bank of river. Many varieties found in guava plants. Guava is perineal plants, grow up to the 30 m height. *Psidium guajava* belongs to family: Myrtaceae is one of the plants which is widely cultivated for its fruits. it is decided to study *P. guajava* in various aspects to exploit it for medicinal purposes. according to World Health Organization reported that over 80% of the world's population uses medicinal plants or its bioactive compounds for the prevention, management, or treatment of several diseases. *P. guajava* plant is a well-known traditional

medicinal plant used in various indigenous systems of medicine. The leaves and bark of *P. guajava* plants have long history of medicinal uses, that is still used today. Phytochemicals are chemical compounds derived from plants that are non-nutritive secondary metabolic compounds occurring in different parts of plants. Phytochemicals are important as protective and disease fighting compounds which help the body to protect from diseases and so are required by the human body for healthy life. (Offor 2015) [3]. The treatments usually involve decoction of parts of the plant, such as leaf, bark, fruit and seeds. Recent works have reported compounds from guava leaves elucidated using various solvent systems that have antidiabetic and antioxidant properties (Adewale et al. 2018).

Secondary metabolites are organic compounds that are not directly involved in the normal growth, development or reproduction of an organism. Unlike primary metabolites, absence of secondary metabolites does not result in immediate death, but rather in long term impairment of the organism's survivability or perhaps in no significant change at all (SRUTHI et al. 2019) [4]. Phytochemical screening of different guava extracts has revealed numerous bioactive compounds. Guava leaf contains broad spectrum of bioactive compounds including tannin, flavonoid, steroid, steroid, glycoside, cardiac glycoside, saponin, phlobatannin, polyphenol, saponin, alkaloids, Phytosteroid and carbohydrate (Dereje et al. 2013) [5]. The ethno-medicinal uses included the crushing of leaves and the application of the extract on wounds, boils and soft tissue infectious site. Stem, bark and root are astringent. Unripe fruit is indigestible, causes vomiting and feverish. Fruit is laxative, leaves are astringent (Dereje et al. 2013) [5]. The guava leaves have a plethora of phenolic phytochemicals such as gallic acid, chlorogenic acid, kaempferol, chlorogenic acid, apigenin, catechin, caffeoyl acid, hyperin, epicatechin, myricetin, caffeoyl and

PRELIMINARY PHYTOCHEMICAL SCREENING AND
PHARMACOGNOSTIC STUDIES OF *EUCALYPTUS RUDIS* ENDL.
(NILGIRI)

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Abstract

Eucalyptus rudis Endl. Commonly known as eucalyptus or flooded gum. Local name of eucalyptus is Nilgiri. The purpose of current study was identifying the primary phytochemicals and pharmacognostic studies of leaves and stem of *E. rudis*. *Eucalyptus* origin is Australia. Most of the species of eucalyptus found in Australia and Tasmania. The eucalyptus was rapidly distributed tropical and subtropical region of world. *Eucalyptus* belongs to the Myrtaceae family and more than 700 species found across the world. Plants are evergreen, large grow up to 45 to 50 m in height. The plant material collected from the different region of Nanded district of Maharashtra. Collected material shade dried and made it powder. The leaves and stem powder were successively extracted with methanol as a solvent. Soxhlet's extraction methods was used. In the present study of pharmacognostic investigation including morphology of plant, macroscopic, microscopic, fluorescence analysis and physico-chemical studies was done. In microscopic investigation stomatal number and stomatal index were done. For the anatomical studies were taking free hand sections of leaf and young stem. T. S. of leaf shows the single layer of epidermis both side of leaf and epidermis followed by cortex, endodermis, bicollateral vascular bundles and scattered secretory cavities. T. S. of young stem shows the primary growth, epidermis covered by thick cuticle, epidermis followed by the few layers of cortex, endodermis, bicollateral vascular bundles and centrally piths. In physico-chemical studies including moisture content, swelling index and foaming index were done and all the observation mentioned in results tables. Preliminary phytochemical screening of *E. rudis*, leaf and stem extract revealed the presence of alkaloid, flavonoids, saponins, triterpenoids, steroid, saponin, tannins, anthraquinone, phenol and carbohydrates, while the absence test of glycosides, fixed oil and coumarin. The findings of this study proved that the *Eucalyptus* plant contain many medicinally important components which helps to preparation of several drugs and treatment of various diseases.

Keywords: pharmacognostic study, *Eucalyptus rudis*, Nilgiri, phytochemical analysis of eucalyptus etc.



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Primary phytochemical and pharmacognostic studies on *Syzygium cumini* Linn. (Jambhul)

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Abstract

From the ancient periods most of the people use lots of herbal medicine. The *Syzygium cumini* Linn plant has a many medicinal properties. The *S. cumini* belong to the Myrtaceae family and occurs in tropical and subtropical region of world. This plant origin is South Asia. In India plant found all over the country and it is used for food and medicine. The present study was conducted to investigate the primary phytochemical and pharmacognostic study of *S. cumini*. The leaves, stem-bark and fruits this plant parts used for the study of primary phytochemical and pharmacognostic examination. The pharmacognostic study based the parameter of macroscopic, microscopic and physico-chemical analysis of plant. The characteristic microscopic features of leaf and stem was observed as serrate, trichomes, multicellular trichomes, phloem cells, xylem cells, collenchyma, spongy parenchyma, vascular bundles and palisade cells. The plant parts like stem, leaves, fruits and seeds of *S. cumini* were collected from local forest of Nanded. The moisture content, swelling index, foaming index and fluorescence analysis of powder were characterized. Fluoresces analysis of *S. cumini* crude powder of leaf, stem and fruits under visible and UV light were recorded. Investigation of primary phytochemical analysis were carried out by the qualitative phytochemical test which showed the presence of alkaloids, tannin, flavonoids, saponin, steroids, triterpenoids, phenol, carbohydrate etc. The results obtained in present study will helps to understand importance of *S. cumini* in medicinal field.

Keywords: Pharmacognostic study, *Syzygium cumini* L., *Eugenia jambolana*, phytochemical analysis, Jambun plant etc.

Introduction

Syzygium cumini Linn. (syn. *Eugenia jambolana*) Plant is commonly known as the Jambun plant in Hindi and Jambhul in Marathi, which is distributed along tropical and sub-tropical regions of world. In India the Jambun plant is distributed in all over the country, it is cultivated and sometime occurs wild. The plant has many medicinal properties, which is used in folk medicine from the ancient periods. This plant belongs to the Myrtaceae family. Although it is a tropical tree but it grows easily in subtropical climates also. *S. cumini* is a fast-growing plant; it can grow up to a height of 30 m and can live for approximately 100 years. Its dense foliage provides shade and is grown just for their fruits and ornamental values (Krishna murti *et al.* 2012) [1]. Jambun plant has reported to contain vitamin C, alkaloids, Saponin, gallic acid, tannins, anthocyanins, glucoside, phenolic compound and other components (Sumdhar *et al.* 2015) [2]. The plant used in many diseases, it is well known for its medicinal and curative properties like hepatoprotective, antidiabetic, antioxidant, antimicrobial, antifungal and various other properties. Their beautiful purple to black colour of the fruit is due to the presence of anthocyanin and is responsible for high antioxidant property (Ruchi Sharma *et al.* 2020) [3]. A variant of the tree produces green coloured young fruit and after ripen the fruit converted as purple to black coloured. The fruit has a combination of fragrant sweet, tstringent flavour and mildly sour tends to colour the tongue purple (Madhulika *et al.* 2016) [4]. Jambun plant start flowering from the month of March to April. The flowers are small, about approximately 5 mm in diameter. The fruits are fully developed and mature in May or June. The fruit is oblong, ovoid in shape and used for food and medicine.

Particularly interesting is the quest for anti-inflammatory, hypoglycaemic, and cancer-fighting bioactive compounds in various herbal plant foods such vegetables, fruits, spices, teas, and medicine. Several of these compounds have been credited with antioxidant and free radical scavenging properties (Soniwal *et al.* 2021) [5]. Almost all parts of jambun tree including leaves, seeds, fruit pulp, kernels and stem bark possess therapeutic efficacy (Akhila 2018) [6]. *S. cumini*, has wide range of medicinal properties, which have been reported as various bioactive compounds present in different parts of plant.

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***Acmella radicans* (Jacquin) R.K. Jansen (Asteraceae), an American weed new to Vidarbha region of Maharashtra State (India)**

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Abstract

Acmella radicans (Jacquin) R.K. Jansen an American weed reported new distributional record from the Vidarbha region of Maharashtra State, India. Its taxonomical description along with phenology, distribution, nomenclature and photographs are provided here.

Key words: *Acmella radicans*, Asteraceae, new record, Vidarbha region, India.

Introduction

The tropical genus *Acmella* Rich. belongs to the tribe Heliantheae (Asteraceae), occurs in high altitude grasslands, ombrophilous forest, cerrado, várzea, and in anthropogenous areas (Campos et al. 2019). The genus is represented by about 30 species in the world (Mabberley, 2008). In India about nine species and two varieties of the genus are known to occur (Reshmi and Rajalakshmi, 2016a, 2016b). In India, five species with rayed heads viz. *A. ciliata* (Kunth) Cassini, *A. uliginosa* (Swartz) Cassini, *A. vazhachalensis* (Sheela) Reshmi & Rajalakshmi, *A. ghoshini* (Sheela) Reshmi & Rajalakshmi, *A. tetralobata* (Reshmi & Rajalakshmi) Reshmi & Rajalakshmi, *A. uliginosa* Sw. var. *pentamera* Reshmi & Rajalakshmi and with discoid heads four species viz. *A. paniculata* (Wallich ex DC.) R.K. Jansen, *A. calva* (DC.) R.K. Jansen, *A. radicans* (Jacquin) R.K. Jansen, *A. oleracea* (Linnaeus) R.K. Jansen. and *A. radicans* var. *debilis* (H.B.K.) Jansen (Sivarajan & Philip 1984; Sivarajan & Ramesan 1987; Sheela 2007, 2010; Reshmi & Rajalakshmi 2014, 2016). (Reshmi and Rajalakshmi, 2016 a) and (Jagtap and Bachulkar 2015). *Acmella radicans* distributed in India viz Maharashtra State (Bachulkar and Awale 2009), Kerala (Sivarajan and Mathew 1984), Tamil Nadu (Raja et al. 2013), Central India (Mujaffar et al. 2013), Uttar Pradesh (Vaishya et al. 2013), Tripura (Somnath Bhowmik et al. 2013), Gujarat State (Patel et al. 2015), Andaman and Nicobar Islands (Naik et al. 2014), West Bengal (Maity et al. 2017), Karnataka (www.efloraofindia.com) and Zarkhand (Bagga and Deshmukh, 2018).

Materials And Methods

During an ethno botanical plant investigation an interesting specimen of *Acmella* was collected from Chikhali Village of Mul Taluka from Chandrapur District, Vidarbha region of Maharashtra State. After a thorough survey of literature and critical examination, this specimen was determined as *Acmella radicans*, it is so far, not recorded from Vidarbha region from Maharashtra State by the earlier workers including (Almeida, 1998; Singh and Karthikeyan, 2000, Singh et al, 2001). About 102 invasive alien plants reported from Chandrapur district (Deshmukh et al, 2012, 2016a, 2016b). The present report of the occurrence of *Acmella radicans*, an American weed as new distributional record for the Vidarbha region, Maharashtra State, India. A brief Taxonomical description along with phenology, distribution, nomenclature and photographs are provided here. Processed herbarium specimens (Voucher No. 245) of the plant are deposited in the P.G. Department of Botany, Janata Mahavidyalaya, Chandrapur, Maharashtra, India.

Result And Discussion

Taxonomic Description : *Acmella radicans* (Jacquin) R.K. Jansen, Syst. Bot. Monogr. 8: 69. 1985; *Spilanthes radicans* Jacq. Collect. Bot. Chem. Hist. Nat. 11(3): 1714. 1804; Sivaraj & Matthew in Anc. Sci. Life 3: 169. 1984; Schrad. in DC. Prodr. 5: 624: 1836. *S. acuminifolia* (Lam.) A. H. Moore, Proc. Amer. Acad. Sci. 42 (20): 531. 1907. (Fig. 1). Erect herbs; stem terete, minutely pubescent. Leaves opposite, ovate, obtuse at base, serrulate at margin, acute at apex, glabrous, 5-7 pairs; petiole 1 cm long, hairy; puberulous. Head white, discoid, conlike, axillary and terminal, 8 - 10 mm across; peduncle 4 - 7 cm long; peduncle 4 - 7 cm long. Glabrous receptacle; subtire at margin, subulate-obtuse at apex. Involucral bracts oblong, 3- served at base, minutely hairy beneath. Paleas keeled along the back, oblong, boat-shaped, concave, 4 mm long, acute or obtuse at apex, glabrous. Corolla tube 2 mm long, bulbous at base, with short neck, 4 - 5 lobed; lobes papillose. Dimorphic achenes with corky and dense, densely hairy margins, ellipsoid, obcordate, marginal ones trigonous, brownish-black, laterally compressed, persistent with 2 subequal bristles.

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THE LOSS OF MEDICINAL PLANT DIVERSITY FROM MAHUR AND KINWAT FOREST RANGES OF NANDED DISTRICT (MAHARASHTRA)

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Abstract

The sudden or gradual disappearance of a species is known as extinction. Extinction has become the destiny of a great number of plant and animal species from earth due to mans own activities and ignorance. The present paper discusses the gradual disappearance of important medicinal plants of Mahur and Kinwat forest ranges. It also focuses on their present position on the line of extinction. Some of these plants are *Psoralea corylifolia* L., *Soyamida febrifuga* (Roxb.) A. Juss., *Holarrhena antidysenterica* Sessu, *Mussaenda xylinia* L., *Hybanthus empetrifolius* (L.) Honanoh retusa (Grh.), *Curculigo orchioides* and *Boswellia serrata* Roxb.

Keywords: Loss of medicinal plants, Mahur and Kinwat forest ranges and Nanded district.

Introduction:

The depletion of biodiversity is an alarming problem all over the world. The sudden or gradual disappearance of a species is known as extinction. Extinction has become destiny of a great number of plants species from earth due to mans own activities and ignorance.

Although species extinction is a natural process that will continue without human intervention, but it is a fact that loss of species is 1,000 to 10,000 times faster than the erstwhile natural rate of extinction.

The conservation of various life forms is not only necessary for our future generation but it is a key to survival and progress of human kind as well as civilization.

There is a global resurgence in the traditional medicinal plants resulting in their excessive exploitation and consecutive depletion.

Marthwada which is one of the 4 divisions of Maharashtra state is having an area of 64,798 square kilometers. The rich plant biodiversity of Marthwada possesses 1,700 Angiospermic plants out of which at least 350 are identified as medicinal plants used in traditional medicine system. (Naik 1998, Rohidas and Bankar 2002).

The medicinal plants are found in Mahur and Kinwat forest ranges of Nanded district, in the present communication discusses the loss of certain important medicinal plants from this area.

Materials and Method:

A continuous survey and observation of medicinal plants was carried out since last fifteen years i.e. 2001 to 2015 from Mahur and Kinwat forest ranges by various workers, (Rathor et.al 2002).The habitat and

distribution of plants was noted and reasons of decline in population of plants was carefully monitored during the course of time, and the attempt was made to find out to which category these plants are heading i.e. endangered, vulnerable, rare and threatened (Jain and Shashtry 1980) The enumeration presented below include botanical name, family, common name, locations/distribution, medicinal use, probable cause of decline in number and probable category towards which it is heading. The suggestions are also have been made regarding strategy of conservation of these plants, (Zanjarao R.S.,2003).

Result and Discussion:

Plant Enumeration:

1. *Soyamida febrifuga* (Roxb.) A Juss (Meliaceae), ROHAN- A tall tree found in Aurangabad, Nanded in Parbhani district. The bark is astringent and having wound healing property. Population decreasing fast due to wood being used excessively for furniture and no replication is done, so likely to become a VULNERABLE species.
2. *Boswellia serrata* Roxb. Ex. Coleb (Burseraceae) SALAI- A middle size tree found all over Marathwada. It is a well known source of Ayurvedic drug. The resin of plant is used for rheumatoid arthritis. Cheap timber is made from wood so uncontrolled cutting of plants by tribals and villagers causing a threat. Gradually becoming a THREATENED species.
3. *Holarrhena antidysenterica*. Sessu. Wall (Apocynaceae) PANDHRA KUDA (Stem bark) INDRAJAW (Seeds) - A small tree


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**EVALUATION OF PHYTO COMPOUNDS FROM PETROLEUM
ETHER EXTRACT OF *ALTRNANTHERA SESSILIS* (L.) DC. BY USING
GC-HRMS TECHNIQUES**

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ABSTRACT

Alternanthera sessilis(L.) DC., belong to family Amaranthaceae occupy an important place in Traditional Siddha Medicine literatures. 'Food as Medicine' is one of the basic concepts of Traditional Siddha Indian Medicine. The today's term Nutraceuticals can be used alternative for Siddha medicine. This plant is used to cure various diseases and being widely used for cooking by people of Southern states of India. Oils and fats are the principle stored forms of energy in many plants and contributing essential part of daily diet. Present study deals with evaluation of phyto compounds from petroleum ether extract of *A.sessilis* leaf by using GC-HRMS technique. Result showed that presence of seventeen compounds including Geranylgeraniol (MW. 290), 2-Bromotetradecane (MW. 276), Cholestan-3-ol (MW. 400), Vitamin E (MW. 430), 1-Heptatriacotanol(MW. 536).

KEYWORDS: *Alternanthera sessilis*, GC-HRMS, Nutraceuticals, Traditional Siddha Medicine.

INTRODUCTION

Due to high side effects of modern medications more awareness has been created towards Nutraceuticals and Traditional Indian Medicine for Healthier life. 'Nutraceutical' the term is designed as a food or parts of food that provide medical or health benefits, including the prevention and treatment of disease (De Felice, 1992) this term is similar to concepts of Traditional Siddha Indian Medicine. The Siddha system of medicine is also one among the precious Medical systems, native to Tamilnadu. Siddha Treatment principles for ultimate



PROXIMATE AND PHYTOCHEMICAL EVALUATION OF A NON-CONVENTIONAL
VEGETABLE- *BIDENS BITERNATA* (LOUR.) MERR & SHERIFF

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ABSTRACT

Non-conventional vegetables refer to the species which are not cultivated at large scale commercially and in times of scarcity of staple food, tribes, local communities use such plants as vegetable. *Bidens biternata* is a widespread weed occurring in moist and shady places of gardens, in farms, village, along the roadside, cultivated areas and along the bank of small channels. Though it is not a commercial vegetable, it occupies an important place among the food of village communities of South India and Western Ghats as wild leafy vegetable. All parts of *B. biternata* are used as ingredients in folk medicines. Present study deals with the analysis of proximate content and phytochemical from leaf of *B. biternata*. Results revealed that it has 82% moisture content, 13.8% of ash, Leaf powder shows high solubility in alkaline solvent than acid and water, Energy value found to be 99.8 Kcal/100gm. The phytochemical studies showed positive result for Alkaloids, phenolics, flavonoids, tannins, caumarins and cardenolins.

KEYWORDS: *Bidens biternata*, Phytochemical, Proximate value, wild vegetables.

INTRODUCTION

Bidens biternata (Lour.) Merr & Sheriff belong to family Asteraceae. It is a widespread weed occurring in moist and shady places of gardens, in farms, village, along the roadside, cultivated areas and along the bank of small channels.^[1] It occupies an important place among the food of village communities and tribe of south India and Western Ghats as wild leafy vegetable.^[2] Non-conventional vegetables refer to the species which are not cultivated at large scale commercially. In times of scarcity of staple food, tribes use this plant as a vegetable.^[3] Methanol extracts from *B. biternata* have been identified to possess antibacterial and antifungal activities.^[4] Its freeze dried extract of possess significant anti-diarrheal activity in *in-vivo* models of diarrhoea.^[5] The genus *Bidens* has been used in traditional medicine as anti-inflammatory, anti-malarial, anti-allergic, anti-ulcer, anti-diabetic, anti-cancer and antibacterial agent.^[6,9,10,11,14] Plant is used by tribes of Madhya Pradesh against snakebites.^[6] Crude methanolic extract of leaves found to be capable providing protection to liver against CCl₄ induced hepatotoxicity.^[12] Whole plant is useful in cold, ulcers, leprosy.^[13]

Since the plant has significant medicinal properties and having good future prospective in nutrition as well for human being, it is important to study the edible part of the plant. The present study has focused on the

evaluation of proximate content and phyto-chemicals from the leaf of *B. biternata*.

MATERIALS AND METHODS

Collection of plant material

B. biternata was collected from different areas of Nanded district of Maharashtra in period of August to October 2014. Collected plant leaves washed, shed dried and powdered. The powdered sample kept in airtight glass container. Plant identification was done at PG Department of Botany, N.E.S. Science College, Nanded using standard flora.^[15]

Proximate analysis

Moisture content, ash value, solubility studies were done in proximate analysis using the AOAC standard methods.^[16] Quantification of Carbohydrates, proteins and fats were done by standard prescribed methods.^[7,8,13] Energy value was finally determined by the following equation^[18]:

Energy value (Kcal/100g) = (4 X % Protein) + (9 X % Fat) + (4 X % Carbohydrate).

Phytochemical screening

Qualitative phytochemical analysis was performed for various phyto-compounds. Iridoid, Anthraquinones, Caumarins, Tannins, Alkaloids, Flavonoids, Polyoses, polyurenoids etc. as per standard procedure.^[17,18]



Original Research Article

Study of future food crop *Bidens biternata* (Lour.) Merr and Sheriff - A nutraceutical approach

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Abstract

Unexploited vegetables refer to the plant species which are not cultivated at large scale commercially but tribes, local communities use such plants as vegetable. *Bidens biternata* is a widespread weed occurring in moist and shady places of gardens, in Farms, village, along the roadside and cultivated areas. Though it is not used commercially, it occupies an important place among the food of village communities of Western Ghats as wild leafy vegetable. All parts of *B. biternata* are used as ingredients in folk medicines, present study deals with the estimation of Nutraceuticals and some essential nutrients from its leaves. Results revealed that it has remarkable percentage of Alkaloids, Flavonoids and Phenolics. High concentration of Calcium, Magnesium and Iron were found in leaf extract.

Key Words: *Bidens biternata*, Nutraceutical, Unexploited vegetable.

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anti-malarial, anti-allergic, anti-ulcer, anti-diabetic, anti-cancer and antibacterial agent (Durre et al 2011, Maicon et al 2008, Masako and Yoshiyuki 2006, Parimalakrishnan et al 2006, Sandra et al 2000). Whole plant is useful in cold, ulcers, leprosy (Shipra et al 2015). Nutraceutical the term coined in 1979 by Stephan De Felice. It is designed as a food or parts of food that provide medical or health benefits, including the prevention and treatment of disease (De Felice 1992). Nutraceutical may range from isolated nutrients, dietary supplements, herbal products and processed products. Nutraceutical play important role in physiological benefits and provide protection against the diseases (Rajsekaran et al 2008). The major nutraceutical ingredients in plant are alkaloids, phenolic compounds mainly Flavonoids (Tapas et al 2008, Marathe and Umate 2016). They have shown regulatory activity of hormones such as transport, metabolism and action of thyroid hormones (Ashok et al 2010). The human beings require mineral elements within certain concentrations for growth and good health. Analyzing the elemental composition in vegetables, fruits and their product is therefore very important for understanding their nutraceutical value. Since the plant has significant medicinal properties and having good future prospective in nutrition as well for human being, it is important to study the edible part of the plant. The present study has focused on the evaluation of

INTRODUCTION

Unexploited vegetables refer to the species which are not cultivated at large scale commercially but tribes use these plant as a vegetable (Sukumaran et al 2012). *Bidens biternata* (Lour.) Merr and Sheriff commonly called *Kata* in regional language belong to family Asteraceae. It is a widespread weed occurring in moist and shady places of gardens, in Farms, village, along the roadside, cultivated areas and along the bank of small channels (Bhatt et al 2012) It occupies an important place among the food of village communities and tribe of Western Ghats as vegetable (Ratheesh et al 2012). It shows to possess antibacterial and antifungal activities (Ahmed et. al. 2016), anti-diarrheal activity (Dennis et al 2016). It has been used in traditional medicine as anti-inflammatory,




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Elemental analysis of *Alternanthera sessilis* (L.) dc. Leaf by ICP-AES technique

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Abstract

The leaf of *Alternanthera sessilis* was screened for quantification of elements. This plant having relevant medicinal properties and are used as wild edible plant in Maharashtra and rest of India. Phyto-chemicals are responsible for medicinal activity of plant species whereas mineral elements play significant role in human metabolism and regulation mechanism. About twenty five essential as well as trace elements from leaf extract have measured by Inductively coupled plasma atomic emission spectrometry, ICP-AES technique. Na, Mg, K, Ca, Cr, Mn, Fe, Ni, Cu, Zn, Cd, Se, Al, Pb, Ba, Hg, As, B, Si, Li, Mo, Te, V, In, Th were screened. Investigations confirmed the presence of varied concentrations of Ca, Mg, K, Fe, Sr, Na, Zn etc. elements in the leaf of *Alternanthera sessilis*.

Keywords: *Alternanthera sessilis*, elemental contents, ICP-AES, wild edible plants

Introduction

Alternanthera sessilis (L.) DC. Commonly called as Kateri or Kanchari in Maharashtra. It belongs to family Amaranthaceae. It is an annual or perennial prostrate herb [1]. About sixteen species distributed in tropics and subtropical areas throughout the hotter regions of India. Plant is propagated through seeds. The plant is bitter astringent, acrid, cooling, constipating, and febrifuge. It is useful in vitiated conditions of *kupho* and *plwa*, burning sensation, diarrhoea, skin disease and fever [1]. It is useful pharmaceutical material to treat inflammation and arthritis [10]. Aerial parts exhibited significant hypoglycaemic activity, antibacterial activity [6-8]. Young shoots and leaves are eaten as vegetable in Southeast Asia [9]. Leaves possess high antioxidant properties in general and hence it can be recommended to be included in our daily diet, as it will protect us from commonly occurring chronic diseases [10]. It is an edible leafy vegetable of South Odisha and contains appreciable amount of nutrients which are readily available [10]. Its regular consumption can provide a solution to myriad of health problems, including malnutrition to a great extent and even in curing deadly diseases like cancer [1]. Human beings require mineral elements within certain concentrations for growth and good health. Many trace elements play a significant role in the formation of active constituents in plants which are responsible for their curative properties [9]. Analyzing the elemental composition in vegetables, fruits and their product is therefore very important for understanding their nutraceutical value. Quantitative estimation of elements can be done with various advanced techniques like inductively coupled plasma atomic emission spectrometry (ICP-AES), Inductively coupled plasma mass spectrometry (ICP-MS), Inductively coupled plasma optical emission spectrometry (ICP-OES), Neutron activation analysis (NAA), X-ray fluorescence (XRF), Anodic stripping voltammetry (AVS) and Flame atomic absorption spectrometry (FAAS). It was found that Atomic absorption and Emission spectroscopy (AAS/AES) techniques could provide not only analysis of wide range of heavy metals but also ensure immense reliability by exhibiting well precision and accuracy at trace level [9]. These techniques are rapid, accurate and producible as compared to regular analytical techniques. ICP-AES method provides accurate elemental food composition data [11].

Therefore, present study deals with determination of 25 essential and trace elements Na, Mg, K, Ca, Cr, Mn, Fe, Ni, Cu, Zn, Co, Cd, Se, Al, Pb, Ba, Hg, As, B, Si, Br, Li, Mo, Te, V, Th in *A. sessilis* leaf by using nitric acid digestion procedure with ICP-AES technique [11]. The data obtained will provide significant information on whether this plant contains essential mineral nutrients and heavy elements in the amounts which can be healthier or toxic at the normal doses if consumed as vegetable.

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Nutraceutical evaluation of *Acalypha indica* L. - A potential wild edible plant

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Abstract

Aim: This study aims to evaluate the nutritional and nutraceutical properties of a traditional medicinal and wild edible plant *Acalypha indica* L. **Materials and Methods:** Qualitative phytochemical analysis was done by prescribed methods, nutritive contents, phenols, flavonoids, and alkaloids were estimated as per standard methods, quantification of mineral elements was done by inductively coupled plasma atomic emission spectroscopy (ICP-AES) technique, and high-performance thin-layer chromatography (HPTLC) was carried and compared with standard gallic acid and quercetin. **Results and Discussion:** Plant shows the good concentration of protein, carbohydrates, fats, and lipids. Phytochemical analysis revealed the presence of alkaloids, phenolics, saponins, flavonoids, tannins, and coumarins. HPTLC analysis was also carried out for the estimation of nutraceuticals and antioxidants. 25 elements were screened by ICP-AES technique, show the presence of Ca, Mg, Mn, Cu, Fe, K, Na, Al, B, Ba, and Sr in appreciable quantity. **Conclusion:** A study indicates the presence of remarkable concentration of nutritive content, mineral elements, and phytochemical which provides strong evidence of nutraceutical and antioxidant property of *A. indica* L. Further, elaborative investigation is needed to validate this plant for its daily consumption as vegetable.

Key words: *Acalypha indica* L., inductively coupled plasma atomic emission spectroscopy, nutraceutical, tribal communities, wild edibles

INTRODUCTION

Acalypha indica L., commonly called as khokli and kuppī, belongs to the family Euphorbiaceae occurs throughout tropical India. Whole plant is used for asthma, pneumonia, bronchitis, and rheumatism.^[1] It is useful in the treatment of skin disease snakebite.^[2-6] Leaves of *A. indica* are used in bed sores, as anthelmintic.^[4,7] The leaf extract has been reported to possess various properties such as antimicrobial, antibacterial, antifungal, antioxidant, and antidiabetic activities.^[8-10]

Leaves are used by the locals of Nandurbar district of Maharashtra as vegetable.^[11] In West Africa, the leaves are cooked and eaten as a vegetable.^[12] Leaves are also consumed by Irlula tribe of Kotagiri hills.^[13] Since *A. indica* L. is an important medicinal herb and has been significantly validated as excellent source of medicine, but its nutritional evaluation is not available.

Wild edible plants play a very important role in the diet of tribal communities. They are major

source of food for tribes of forest area. Edible parts of wild plants are promising gift of nature to mankind, these are not only delicious and refreshing but also the chief source of vitamins, minerals, proteins, and other nutrients.

"Nutraceutical" the term coined in 1979. It is designed as a food or parts of food that provides medical or health benefits including the prevention and treatment of disease.^[14] Nutraceutical may range from isolated nutrients, dietary supplements, herbal products, and processed products. Nutraceutical plays an important role in physiological benefits and provides protection against the diseases.^[15]

The major nutraceutical ingredients in plant are phenolic compounds mainly flavonoids.^[16] Gallic acid (3, 4, 5-trihydroxybenzoic acid) is naturally occurring

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Evaluation of Charu Prepared from *Acalypha Indica* L- An Important Medicinal Plant of Traditional Siddha System Useful in Treating Skin Diseases

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Abstract Siddha system of medicine is practiced in regions of South India. The eighteen Siddhars were the men who achieved supreme knowledge in the field of medicine, yoga and tap, since then this system of medicine developed. *Acalypha indica* is an important medicinal plant mentioned in Siddha literature. In the present study, Charu prepared from raw powder of leaves of this plant were evaluated by using different techniques like Fourier Transform Infrared (FTIR) Spectroscopy analysis for determination of associated functional group, Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) for the quantification of trace and heavy elements and antifungal activity of Charu were tested. FTIR analysis showed the broad peaks for numerous functional groups like alkanes, alkynes, alkyl halide, aromatics, alkaloid etc. Elemental analysis from this plant shows good results for most of trace as well as heavy elements which have great significance in diet. Plant product Charu shows good antifungal activity against four different pathogenic skin disease causing fungi and hence the formulation can be used to treat dermal infections.

Keywords Antifungal Activity, FTIR, ICP-AES, Siddha System

1. Introduction

The term Siddha means achievement and Siddhars were saintly personality who attained proficiency in medicine through practice of bhakti and yoga. According to traditional Indian belief lord Shiva unfolded the knowledge of medicine to his wife Parvati which was then passed to Siddhars and known as Siddha system of medicine. This is the system of pre-Vedic period identified with Dravidian culture and is largely therapeutic in nature. Like Ayurveda,

this system believes three humours i.e. vatta, pitta and kapha and all objects of universe are made up of five basic elements called Panchmahabhuta namely earth, water, sky, fire and air. In this system identification of cause of disease is done by pulse reading called Nadi pariksha, colour of body, tone of voice, urine examination etc. the literature of this system mostly available in Tamil language. Different treatments were mentioned in this system, the material medica of Siddha system of medicine based on metal and mineral origin. The drugs used in disease treatment are herbal formulations with collective effects. Some important medicinal plants used in this system are *Papever somniferum*, *Euphorbia nerifolia*, *Aloe barbandensis*, etc [1].

The Leaves, roots, stalk and flowers of *Acalypha indica* are used in Siddha System of Medicine for its medicinal properties. According to Siddha Materia medica the leaf powder when given in the dose of 950 mg to 1300 mg, cures respiratory diseases. The leaf juice when mixed with Neem oil and applied to the inner part of children's tongue with the help of quill, induces vomiting and acts as expectorant. Its other actions include cathartic, anthelmintic, emetic, anodyne and wound healing properties [2]. Whole plant is used for asthma, pneumonia, bronchitis and rheumatism [3]. It is useful in treatment of skin disease, snakebite [4, 5]. The leaf extract has been reported to possess various properties such as antimicrobial, antibacterial, antifungal, antioxidant and antidiabetic activities [6, 7, 8, 9, 10]. It is an important wild edible plant with prominent nutraceutical values [11]. Extracts of leaves called "Charu" obtained by grinding them and is used in treating different fungal infections of skin [12]. Nowadays many skin related infectious diseases are spreading, specifically the high populated countries like India and hence it is very important to develop quick remedy for such infectious diseases.




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Ethno-veterinary medicinal plant species of Hadgaon Taluka, Nanded District, Maharashtra, India

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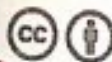
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ABSTRACT

Ethno-veterinary medicine is a system which is based on folk beliefs, traditional knowledge, skills, methods, and practices used for curing diseases and maintaining health of animals. The present study deals with the documentation of novel Ethno-veterinary practices from Hadgaon taluka belonging to 25 families have been recorded against 31 livestock diseases. These plant based medicines are readily available and found effective against various domestic animal diseases. The livestock plays an important role in the life of farmer and tribal people.

Keywords: Animal diseases, Ethno-veterinary practices, Hadgaon Taluka, Ethno-veterinary medicinal plants

INTRODUCTION

Ethno-veterinary medicine is a system which is based on folk beliefs, traditional knowledge, skills, methods, and practices used for curing diseases and maintaining health of animals. The term 'Ethno-veterinary' was introduced by Dr. Constance M. McCorkle. It was first used in her article "An introduction to Ethno-veterinary research and development". It is used regarding indigenous knowledge that is passed on from generation to generation through verbal verdicts (McCorkle, 1986).

Some reports of documentation of ethno-veterinary practices of various parts of Maharashtra are available such as in Buldhana district (Patil *et al.*, 2010; Marathe *et al.*, 2010), Chandrapur, Nagpur and Gadchiroli district (Kulkarni *et al.*, 2014), Akola district (Jambu and Wath, 2018). In Marathwada region, very few attempts have been made for documentation of ethno-veterinary information such as in Jalna district (Deshmukh *et al.*, 2011).

According to World Health Organization, at least 80% of people in developing countries depend on indigenous practices for animal diseases. The livestock plays a crucial role in farmers and tribal people life.



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Phytochemical screening and antioxidant activity of *Calotropis gigantea* Linn. flowers in polar and non-polar solvents

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Abstract

The plant *Calotropis gigantea* Linn. belongs to the family Asclepiadaceae and is commonly known as 'Ark', which has aesthetic and religious value in Indian culture. In Ayurveda, various parts of plants were used for traditional treatment of various diseases as well as curative agent. The current information and knowledge regarding *Calotropis gigantea* Linn. flower world scientist and researcher have received more attention in concern with an ethnopharmacological view in recent years. The present research work focused on *Calotropis gigantea* Linn. flower. Phytochemical analysis was done by standard method exposed a diverse group of phytochemicals such as alkaloids, flavonoids, terpenes, carbohydrates, saponins. The extract of *Calotropis gigantea* Linn. flower in polar (Methanol) and non-polar (Hexane) solvent was evaluated for DPPH and OH⁻ radical scavenging activity.

Keywords: phytochemicals, *Calotropis gigantea* Linn, polar and non-polar solvent, DPPH

Introduction

The plant *Calotropis gigantea* Linn. Commonly called giant milkweed, is a wild xerophytic weed commonly found in the sub-tropical region of India. Genus *Calotropis* was a Greek-derived word that means beautiful coronal scales is a small shrub that grows in xeric condition. The studied plant belongs to the family Asclepiadaceae, characterized by the presence of taproot, stem, and leaf with soft tomentum, flower having lobed calyx, campanulate corollas, and coronal scales. Pollinia is the special character of this flower [1]. The flower of *Calotropis gigantea* invites worldwide researchers for pharmacological activities such as anti-inflammation and anti-ulcer [2]. The leaves extract of *C. gigantea* were screened for antibacterial, phytochemicals by using water, methanol, ethanol, chloroform, n-hexane, and ethyl acetate solvents. The extract of leaves was found to be most effective with MIC ranging from 0.25 to 1.0 mg/ml against *Bacillus cereus* and *Salmonella typhi* in ethyl acetate [3]. Malformation in mango fruit and reduction in harvesting yield caused by fungal pathogen *Fusarium mangiferae*. Fungal mycelium growth inhibited by flower extract of *C. gigantea* in hexane, methanol, and water-methanol (70/30 v/v) with 5000 ppm and 10000 ppm concentration shows (2±0.9a & 2±0.2a) (4±2.4b & 5±0.1) (5b 3± & 2b 4±1.5b) (4). The dried powdered leaves of *C. gigantea* extraction in methanol, chloroform, n-hexane, ethyl acetate, and butanol extract found 3 new compounds viz., lignan, 90-methoxypinoresinol, and two new glycosylated 5-hydroxymethylfurfural, calofuralside A and calofuralside B have been isolated from the active fractions, CHCl₃ (IC₅₀, 0.32 lg mL⁻¹) and EtOAc (IC₅₀, 0.55 lg mL⁻¹) fractions of the leaves of *Calotropis gigantea*. NMR and MS data were used for elucidating their structure. Among these isolated compounds, compounds 1 and 2 exhibited greater potent for cytotoxicity against PANC-1 human pancreatic cancer cell line under the following condition

with IC₅₀ values of 3.7 and 3.3 μM, respectively [4]. Methanolic extract of *C. gigantea* shows weak acid and weak base indicators in titration [5]. The milky latex of *C. gigantea* contains hydrocarbons, sterols, fatty acids, and terpenes. Seven spots have been observed on the TLC plates; out of which 3 were identified as calotoxin, uscharin, and calactin. Macroelements and microelements were investigated in the latex and similarly in the leaves and bark from the AA spectra [6].

Materials and Methods

Plant material

Healthy flowers of plants were collected from a different region of Nanded (MS) during their floral growth of the different seasons. Flowers were authenticated and identified by Dr. M. M. Pund (Asst. prof. & Head Dept. of Botany, Indira Gandhi Senior College Nanded MS, India).

Chemicals

All chemicals and reagents were obtained from commercial sources with AR grade (HI Media Pvt. Ltd. Mumbai).

Extraction

Flowers were shaded dried and coarsely grind to a fine powder using a blender (Bosch Pro 1000W Mixer). 15 grams of powder used for extraction in aqueous, methanol, chloroform, and hexane solvents one by one separately, the crude extract was concentrated and evaporated and stored in a deep freezer at 4°C for further use.

Percentage Yield

The obtained yield of extract of flower in different solvents by using Soxhlet Extractor was used. The percentage yield flower extracts in different solvents were determined with the formula



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Brine shrimp lethality assay of some selected medicinal plant flowers in polar and Non-polar solvents

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Abstract

The present research work was conducted to investigate the in-vitro Brine Shrimp Lethality Assay (BSLA) of some selected plant flowers extract in a polar and non-polar solvent and correlate cytotoxicity results with known pharmacological activities of the plants. Cytotoxicity was evaluated in terms of LC_{50} (lethality concentration). The LC_{50} of an agent is the concentration, which kills, or inactivates 50% of the test animal. LC_{50} is inversely proportional to the toxicity of a compound, i.e., the lower is the LC_{50} , the higher is the cytotoxicity. Aqueous extract of *Catharanthus roseus* 150 LC_{50} ($\mu\text{g/ml}$) and methanolic extract of *Tamarindus indica* 236.66 LC_{50} were considered for the bioactive compound shown cytotoxicity correlated with the anticancer property. Whereas chloroform extract of *Calotropis gigantea* with greater than 1000 LC_{50} value is considered as toxic activity. It indicated that this bioassay has a good correlation with the human solid tumor cell lines.

Keywords: brine shrimp lethality assay; cytotoxicity, LC_{50} , medicinal plant flowers; polar and non-polar solvent

Introduction

Plants synthesize a diverse range of bioactive molecules, making them a rich source of various types of medicines. Approximately one-half of all licensed drugs that were registered worldwide in the 25 years period before 2007 were natural products or their synthetic derivatives (Newman and Cragg, 2007) [1]. Great information about the preventive and curative application of medicinal plants mentioned in Ayurveda. Over 50% of all modern clinical drugs are of natural product origin (Steffens *et al.*, 1982) [2] and play an important role in drug development programs in the pharmaceutical industry (Baker *et al.*, 1995) [3]. The general acceptability of herb products has been limited by the lack of dose regimen, adequate toxicity data, and large information about the phytochemical content of these plants (Pousset, *et al.*, 1988) [17]. All studied plants like *Catharanthus roseus*, *Polianthes tuberosa*, *Tamarindus indica*, *Moringa oleifera*, *Azadirachta indica* and *Calotropis gigantea* used in the present study are showing medicinal importance. The studied plants have antioxidant effects (Sharma, V, *et al.*, 2013, Barghout, N, *et al.*, 2018 and Reis *et al.*, 2016) [12, 23] with the presence of such phytochemical components as equivalent to standards in different extracts, the cytotoxic effect (Nguyen, K. D. *et al.*, 2017 and Ali G. H. *et al.*, 2004) [15, 1] and the antitumor effect (Aravind, S. R., *et al.*, 2012 and Zhu, W. F., *et al.*, 2020) [2, 21]. These plants also show potent antimicrobial activities (Ghosh, P. K., *et al.*, 2014 and Ali G. H. *et al.*, 2004) [8, 1].

The brine shrimp lethality assay is based on the ability to kill laboratory-cultured *Artemia nauplii* (brine shrimp) and is considered a useful tool for preliminary assessment of toxicity (Solis *et al.*, 1993).

Therefore, the present study was undertaken to investigate the cytotoxic activity of flower extract of some selected medicinal plants.

Material and Methods

Plant material

The flowers were collected from different localities of the Nanded district of Maharashtra, India.

season and identified with the help of standard flora (Naik, 1988) [12].

Plant material extraction

The flowers were collected, shade dried and powdered into fine coarsely form. 15 gm powder weighed and used for Soxhlet extraction by using polar solvent (water and methanol) and non-polar solvent (chloroform and hexane) respectively. The extracted samples were evaporated at approximately 40°C. The dried extracts were stored at 3-4 °C and used for further analysis (Azwanida N.N., 2015) [13].

Brine shrimp lethality assay

Sample preparation

Preparation of seawater

The crude sea salt 25g/L, dissolve in distilled water and 7mg/L of dried brewers yeast was added to this solution for food of brine shrimp. It was filtered through filter paper before using.

Hatching of brine shrimp eggs

The 2.0 L of seawater was added to the special chamber 40 mg of the eggs were washed with water and then these eggs were sprinkled into the compartment which was darkened. After 48 hrs the phototropic nauplii were collected by capillary from the lighter side and used for bioassay.

Bioassay

The Bioassay experiment was performed according to the procedure described by Meyer *et al.* 1982 [12]. Nauplii were drawn in a glass capillary along with water, and ten of such shrimps were transferred to each sample vial containing 4.5 ml brine solution (specific volume brine and yeast suspension) after they were counted in the stem of the capillary against the lighted background. In each experiment, 100 μg , 500 μg , and 1000 μg extract of the flower were added to 4.5 ml of brine solution of mentioned



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Moringa Tree, Gift of Nature: a Review on Nutritional and Industrial Potential

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Abstract

Purpose of Review Worldwide occurring *Moringa* plant is commonly famous as a fruit vegetable, known as *drumstick* or *shyva* all over India. The miraculous nutritional potential of the drumstick plant was already proved by worldwide research. But in the common population, it is unknown for the nutritional potential of its leaves. The majority of the population is known it only as a fruit vegetable. The *Moringa* leaves contain almost all essential nutrients, growth factors, vitamins, amino acids, proteins, minerals, and metals like potassium, iron, and zinc. Besides these, nowadays, plant leaves may be used to prepare various nutritional supplements and medicine.

Recent Findings Besides this, this review takes into account some joint efforts of NASI, Allahabad-funded project to use these *Moringa* leaves for different formulations and its popularization efforts for malnutrition eradication in tribal, i.e., development of recipes of *Moringa* leaves that will not only make easy preparations but also help to make habitual use of *Moringa* leaves today.

Summary This review describes the morphology, occurrence, and distribution of *Moringa* sp., chemical constitutions of *Moringa* leaves, its potential as anticancer, antidiabetes, and antimicrobial agent and as a nutritional supplement and the commercial future of various products.

Keywords Magic tree · Phytochemical · Therapeutic potential · Nutraceutical · Malnutrition

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Introduction

In our country, around 194 million people go hungry every day. The COVID situation created this scenario more tragic. Most of the population lack feasibility and affordability for sufficient and nutritious food to maintain their health, i.e., immunity. 50% of children and women from the tribal community are anemic. The COVID-mediated unemployment created a problem of food security among the poor; it will be fulfilled by some national programs but still, the nutrient insecurity problem remains as it is. During the COVID pandemic situation, the immunity booster remains a trending topic. Most of the promoted advertisements and posts of immunity boosting during pandemics nearly all have commercial interest. So there is an urgent need to provide people and make them aware of easily available natural green nutritious supplements available in their local area. This review will take account of commonly available nutritional supplements from the "*Moringa*" plant along with its pharmacological components; its potential as antioxidants, antimicrobial,



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STUDIES ON ARBUSCULAR MYCORRHIZAL FUNGI FROM SOIL OF SITAKHANDI FOREST OF MAHARASHTRA

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ABSTRACT

Forest ecosystems are the regions where there is least human interference and therefore we see luxury of plant growth. Sitakhandi forest is one of the least human interfered forests present near Bhokar region of Nanded district in Maharashtra. Arbuscular mycorrhizal fungi (AM fungi) develops symbiotic relation with most of the land plants. This association is very common in the terrestrial ecosystem throughout the world. The objective of the current study is to identify and determine frequency of various AM fungal species. Five GPS marked sampling sites were selected for isolation of mycorrhizal spores. A total 34 species belonging to genera *Glomus*, *Acaulospora*, *Scutellospora*, *Gigaspora*, *Diversispora*, *Enterospora* and *Parclipsora* were reported. Little variation is seen in their frequency. In this study, more species diversity among *Glomus* followed by *Acaulospora* were found. High frequency percentage of *Glomus mosseae* has been reported at all study sites.

Keywords: Mycorrhiza, *Glomus*, *Acaulospora*, Sitakhandi forest.

1. INTRODUCTION

Symbiotic Arbuscular Mycorrhizal Fungi (AM fungi) forms an extensive hyphal network for providing water and nutrients to living plants [1]. These symbionts are most commonly found in large majority of terrestrial plants [2]. The AM fungi belong to phylum Glomeromycota which forms main component of soil mycoflora. From the past three decades, this group of soil mycoflora have drawn the attention of researchers because of their ability to form intimate association with 70 to 90% of plant species [3]. In addition to nutrient uptake, this association is involved in protection against soil borne pathogens and improvement of soil fertility and stability. Their detection and studying diversity in soil is very essential for any agro-ecosystem [4]. Approximately, 150 AM fungi have been described by means of morphological characteristics of spores [5]. Because of their wide presence in soil, it is believed to contribute significantly to global phosphate and carbon cycle and influences primary productivity in terrestrial ecosystem [6]. Establishment of such mutualistic relationship can stimulate, activation of antioxidant, phenylpropanoid, and carotenoid pathways [7]. Synthesis of plant secondary metabolite which are important for increased plant

tolerance to abiotic and biotic stress are beneficial to human health through their antioxidant activity [8]. These obligate symbionts are not host specific and one species may found to be associated with various plants in the same locality [9] and also one host plant can support mixed population of AM fungal species [10]. Sitakhandi forest is about 39 km away from Nanded and Bhokar respectively. It is divided in to minor south and major north region by a middle road. The forest cover is approximately 7.0 km². It is dominated by plant like Teak (*Tectona grandis* L.) and also consists of various types of herbs and grasses. The vegetation of forest comes under the category of dry deciduous type. Since this forest has thick plant cover therefore we observe least interference from human. Therefore, we have undertaken this study.

2. MATERIAL AND METHODS

2.1. Collection of Soil Samples

For the present work, rhizospheric soil samples were collected from Sitakhandi forest. Samples were collected in the month of June-21 from five different sites. The geographic locations of sites are shown in the Fig 1. Sampling sites are named as S-1 (19° 14' 18" N and





Ethnoveterinary practices for reproductive ailments by villagers nearby Ambabarva Wildlife Sanctuary, Buldhana District, MS, India

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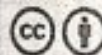
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ABSTRACT

The Amba Barva Wildlife Sanctuary is situated in satpuda hills of Buldhana District of Maharashtra. The current study is based on a comprehensive field survey that the authors conducted in this area for ethnoveterinary applications, with a focus on reproductive problems, between June 2019 and July 2022. Traditionally, local and tribal people in this area have used locally accessible ethnoveterinary medicines to treat a variety of illnesses affecting the animal populations. This study report contains data gathered from 68 Vaidus or informants, in the specified region. The 21 families comprise a total of 25 plants that were mostly used to treat reproductive diseases and abnormalities in domestic animals, such as anestrus condition, placenta retention, uterine prolapse, etc.


Keywords: Reproductive ailments, Ethnoveterinary, Ambabarva Wildlife Sanctuary.

INTRODUCTION

Since human civilization man use medicinal plants to cure various ailments of cattle. A cattle farming is one of the most income generating occupation in India. It also helps in agricultural work and maintenance in various ways to enhance Indian economy even present day. Ethnoveterinary medicine, deals with traditional animal health care which encompasses the knowledge, skill, methods, practices concerning animal health care (Kumar and Nagayya, 2017). These ethnoveterinary medicines are used by villagers traditionally to treat animals. Many authors documented traditional ethnoveterinary practices of Buldhana district Maharashtra State (Marathe et al., 2010; Patil et al., 2010; Pocchi, 2013; Patil and Rothe, 2017). This is totally based on knowledge acquired by traditional healers from his ancestry. This indigenous knowledge of the veterinary health care is sometimes also be transmitted orally from one generation to next generation. Thus, it is time need to conserve the hole documentation of these indigenous knowledge.

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ASSESSMENT OF THE NUTRITIONAL QUALITIES AND HEALTH ADVANTAGES OF FINGER MILLET

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Abstract:

Despite their significance, millets remain unexploited crops in semi-arid and tropical parts of the globe because of their remarkable environmental adaptation and increased resilience to diseases and pests. Taking into account their high crop yield, they can endure elevated salt content, a short period of development, adaptability to drought, opposition to water retention, minimal input requirements, and significance as crops destined for human consumption in light of the rising world's inhabitants and depleting water resources. India is the world's largest producer of millet. Of the minor millets grown in India, finger millet is grown on the most land. In India, finger millet, or ragi, is a treasure trove of health benefits. Finger millet comprises 344 mg of calcium, making it an excellent source of the mineral. It also contains a lot of vital amino acids, including leucine, isoleucine, methionine, lysine, etc. It has high levels of iron, micro- and macronutrients, minerals, phytates, and dietary fiber. These components make it deserving of numerous health advantages. Indians are unaware of the plant's potential advantages against numerous ailments, despite its abundance of components and minerals. Although it is highly nutritious and has advantages, it is not consumed in many places because of its reddish hue. This paper aims to raise awareness among growing populations about the health benefits of finger millet.

Key words: Finger millet, nutritional, health benefits

Introduction:

Eleusine coracana (L.) Gaertn. also referred to as finger millet, is an ancient crop that can be grown extensively in a variety of agroclimatic conditions. It is particularly significant in semi-arid regions of Asian and African countries, where it serves as an essential staple food for small-scale producers as well as a vital source of nutrition (Thakur, 2023). Of all the little millets cultivated in the Indian subcontinent, finger millet takes up the majority of land. There are three distinct varieties of finger millet which includes white, reddish-brown, and black (Gebre, 2019). Of all the grains, ragi offers the greatest concentration of both iron and calcium. Finger millet is free of gluten and has a significant amount of carbs, phytochemicals, dietary fibre and necessary amino

Statistical analysis of Ethno-veterinary plants from Bhil, Pawra, Tadvi and Korku tribes of Buldhana district, Maharashtra: A benevolence for health of native animals

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Abstract

The tribal communities like Bhil, Pawra, Tadvi and Korku are gold mines of traditional veterinary knowledge as they have been using plants to keep their livestock healthy and free from diseases. Several factors of modern civilization day by day is getting diminished this knowledge. The present research study was goal to survey and document the medicinal plants used to treat various livestock diseases traditionally by these tribal communities in the Buldhana district, Maharashtra, India. Survey was conducted in 18 villages of Buldhana district, during 2019-2021. Information was collected from the tribals using rapport, semi-structured questionnaires and analyzed quantitatively using various statistical parameters. The total of 39 medicinal plant species belonging to 23 families of 39 genera were documented. It was found that the plant species which predominantly used are herbaceous (68.93%). The most commonly used plant part in the herbal preparations were leaves (34.79%), fruits (26.08%), roots/tubers (19.57%), seeds (13.04%), Gum (4.34%) and flowers (2.18%). Use-value, fidelity level percentage and use report were obtained to be in the range of 0.03-0.33, 3.7-100% and 1-27 respectively. Based on values, *Balanites roxburghii* Planch. was found to be the most important and dominant species used by the tribes. Maximum number of plant species (39 species) were used to treat the gastrointestinal disorders.

Key words: Statistical analysis, Ethnoveterinary, Tribal, Buldhana

Introduction

The experience, practices, beliefs and skills of indigenous communities in curing various ailments of livestock is a holistic body of ethno-veterinary knowledge. Ethno-veterinary medicine is a universal interdisciplinary study of the local knowledge and the socio-cultural structures and environment associated with animal health care and husbandry (Tiwari and Pande, 2010). The knowledge of ethno-medicinal plants, mode of administration and doses varies across countries, regions, and communities. Hence, to keep animals healthy, traditional healing practices have been applied for centuries and have been passed down orally from generation to generation (Phondani *et al.*, 2010).



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Fermentation of banana juice using grape fruit juice inoculum

Pravin G Paul, Santosh M More, Archana S Pethe, Dayanand M Jadhav and Pradip D Satav

Abstract

Present study was performed to investigate the effect of white grape must (WGM) and red grape must (RGM) inoculum on fermentation of banana wine. The banana must was prepared from pulp of ripe banana fruits. Pectinase enzyme and potassium metabisulphate (KMS) were added to the juice. Then it was chaptalized to 19°Brix. Diammonium phosphate (DAP) was added to this and pH adjusted to 3.5. The inoculum of WGM and RGM were used at a concentration of 10% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20 °C for about 22 days. Physico-chemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using WGM and RGM had °Brix (6.1), alcohol (4.38 and 4.24%) and titratable acidity (0.93 and 0.88%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different grape must inoculums.

Keywords: Banana must, banana wine, volatile acids, red grape must and white grape must

Introduction

Wine is a fermentation product included in alcoholic beverage category and is produced by fermentation of fruit juice. The fruit having good amount of sugar can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, banana, pineapple, orange, coconut, mango and strawberry wine (Reddy *et al.*, 2012; Shweta *et al.*, 2016; and Ranjitha *et al.*, 2015) [10, 11, 12]. Beside high production of banana fruit, its post harvest losses are more because of its perishable nature. Thus production of banana wine is one the alternative to prevent the postharvest losses of banana fruits. For this appropriate yeast inoculum should be used. Grape fruits are the most common substrates for the production of fruit wine either by using wild yeast present on the fruits or by adding suitable yeast starter. The fruit itself has plenty of fermenting normal flora which is used for production of wine. Thus we can employ grape fruits as a direct source of fermenting yeasts. Various reports on production of banana wine are increasing (Osuwika and Awam, 2001; Akubor *et al.*, 2003; Cheirsilp and Umsakul, 2008; and Isitua and Ibeh, 2010) [13, 14, 15]. However as per our knowledge very less work is reported in India which focuses on fermentation of banana wine by using grape juice inoculum as well as on volatile acid analysis of such wines. With respect to this here we have made an attempt to investigate the effect of fermentation of banana wine by using grape juice inoculum on physicochemical parameters and volatile acid in banana wine.

Material and methods

Preparation of banana must

Ripe banana fruits were procured from local market of Nanded, Maharashtra, India. These fruits washed with tap water, hand peeled, cut in to thin slices and then grind in mixer. This pulp homogenate was then mixed with water in 1:1 proportion. To this 0.02% of pectinase enzyme to reduce the viscosity and 100 mg/L potassium metabisulphate (KMS), to kill the unwanted microorganisms, were added and the mixture was held at room temperature for 4 h. Pectinase treated juice was then chaptalized to 19°Brix using table sugar, DAP at a concentration of 200 mg/L was added to this and its pH was adjusted to 3.5 using citric acid and calcium carbonate. Then it was kept at 10 °C until required.




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Effect of must dilution on fermentation of banana fruit pulp into white wine

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Abstract

Preparation of a wine from the banana fruits was undertaken and effect of dilution on fermentation of banana wine was investigated. Must was prepared from healthy and ripen banana fruits which was inoculated with 2% (v/v) of yeast inoculum followed by fermentation. Physicochemical analyses of wines were then performed. Banana must with 1:0 and 1:1 dilution gives wine with 14% alcohol.

Keywords: banana wine, must dilution, fermentation

Introduction

Banana fruit has thick pulp and thus could not be fermented into desired product. Thus before fermentation the banana pulp must be homogenized and diluted with appropriate proportion of water. Effect of dilution and maturation on physico-chemical and sensory quality of jaman (Black plum) wine was reported by Joshi *et al.*, (2012)^[1]. Ranjitha, *et al.*, (2015)^[2] standardized the process for production of banana wine by diluting the pulp in various ratios with water. Various reports on fermentation of banana wine are increasing day by day (Oswuka and Awam, 2001; Akabor *et al.*, 2003; Cheirsilp and Umsakul, 2008; and Isina and Ibeh, 2010; Awe *et al.*, 2015)^[3, 4, 5]. However as per our knowledge, research is lacking on effect of dilution of banana must in various proportions on fermentation of banana wine needs to be studied in detail. In view of this the present study was conducted to study the effect of dilution of banana must on fermentation of banana wine.

Material and Methods

Preparation of banana must

The fully ripened and undamaged banana fruits were purchased from the Local market of Nanded, Maharashtra during the month of May, 2015. The fruits were brought fresh to the laboratory and processed within two days. Must was prepared from healthy and ripen banana fruits. Banana fruits were washed with tap water and peeled manually. Pulp from each fruit was weighed, sliced into small pieces with a stainless steel knife and homogenised in a kitchen mixer. Pulp homogenate mixed with two part of hot boiled water (1:2, pulp: water (w/w)). Potassium metabisulfite (100 mg/L) was added to prevent the growth of unwanted microorganisms (Considine and Frankish, 2014) and kept for cooling at room temperature (26-28°C) for 2 h. The juice thus obtained was treated with 0.01 % (w/w) pectinase enzyme. Then this must was kept overnight for pectin hydrolysis at room temperature. This must was stored at 4 °C until required.

Effect of dilution

To study the effect of dilution on physicochemical characteristics of wine the must was diluted in following proportion with water; 1:0, 1:1, 1:2, 1:3 and 1:4 (must : water, v/v). The final volume of each mixture was 400 ml. Total soluble solids (TSS) of each treatment were adjusted to 20°Brix using cane sugar. pH was adjusted to around 3.40 using citric acid and diammonium phosphate was added to each flask at a concentration of 100 mg/L.

Fermentation process

For preparation of inoculum 6 g of Baker's yeast (*Saccharomyces cerevisiae*) was added to 300 ml of banana juice and incubated at 28-30 °C for 48 h. The must from each treatment was inoculated with 2 % (v/v) of inoculum containing 2.9×10^8 cfu/ml. The yeast cell count was done by using spread plate method on yeast extract peptone dextrose agar. Fermentation was carried out at room temperature (25-30 °C). Fermentation was allowed to complete for 24 d. Physicochemical analyses of wines were then performed.

Physico-chemical analysis

The pH of the must and wine was measured with a digital pH meter (Systronics, India), pre-calibrated with buffers of pH 4.0 and 7.0. Titratable acidity was determined by titrating with 0.1 N NaOH as described by AOAC and alcohol % was determined by using alcohol hydrometer as per the method described by Amerine and Ough (1980)^[6]. Total soluble solids (TSS) were determined using Abbey's refractometer (0-32) in terms of °Brix (Jacobson, 2006)^[7]. Volatile acidity was determined by titration of distillate samples and expressed as percent of acetic acid per 100 ml of wine.

Results and Discussion

Physicochemical characteristics of must

In present study to facilitate optimum fermentation,




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Effect of Pectinase Treatment on Physicochemical Parameters of Banana must and Wine

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Abstract

Preparation of a wine from the banana fruits was undertaken and the effect of pectinase concentration on physicochemical parameters of banana must and wine was investigated. Must was prepared from healthy and ripen banana fruits which was inoculated with 2% (v/v) of yeast solution followed by fermentation. Physicochemical analyses of must and wines were then performed. Banana must with 1:0 and 1:1 dilution gives wine with 14% alcohol.

Key words: banana wine, must dilution, fermentation

Introduction

Banana fruit has thick pulp and thus could not be fermented into desired product. Thus before fermentation the banana pulp must be homogenized and diluted with appropriate proportion of water. Effect of pectinase treatment on physicochemical properties of banana wine was reported by Chemsip and Ursakul, 2008. Rauntra, et al. (2015) standardized the process of banana wine by diluting the pulp at various ratios with water. Various physicochemical characteristics of banana wine are increasing day by day (Omuka and Awara, 2001; Maithele et al., 2001; Chemsip and Ursakul, 2008, and Isma and Ibeh, 2010; Awe et al., 2013). However, to the best of our knowledge, very less work is carried out on effect of pectinase concentration on physicochemical parameters of banana must and banana wine. In view of this the present study was carried out to study the same.

Material and Methods

Preparation of Banana must and Effect of Pectinase Treatment

Four banana fruits were purchased from local market of Nanded. The fruits were allowed to ripen at room temperature. Then banana fruit was cut into pulp and water was added to it. The pulp was diluted with water at various ratios (1:0, 1:1, 1:2, 1:3, 1:4, 1:5, 1:6, 1:7, 1:8, 1:9, 1:10) and then pectinase was added to it.



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HPTLC Profiling and Antimicrobial Studies of Some Commonly Used Indian Spices

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ABSTRACT

Indian medicinal system is one of the most believable and traditional system of medicine in the world where we find importance of spices and condiments in daily life. Spices have been in use as food additives since ancient times. They are used as flavoring agent and also as preservatives. Most of the spices are indigenous in origin with characteristic aroma and strong taste. These spices not only add flavor to dishes but also they have lots of medicinal properties. By considering their polyvalent significance in present investigation we have made an attempt to study antimicrobial potential and HPTLC profiling of *Curcuma longa*, *Cinnamomum verum*, *Cuminum cyminum*, *Piper nigrum*. Chromatographic analysis (HPTLC) showed presence of several phytochemical compounds with variable R_f value and concentration. The antibacterial activity showed significant growth inhibition against *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Streptococcus pyogenes*, and *Streptococcus pneumoniae*. The mixture of phytochemical compounds present in the extracts might be responsible for the antibacterial activity against these bacteria. The results obtained support the application of these spices in several traditional ethnomedicinal applications. Furthermore, HPTLC fingerprint developed may be useful in the correct identification of these spices and in detecting adulterations in preparation of commercial spice packets.

Key Words: HPTLC, Antimicrobial Activity, Spices.

I. INTRODUCTION

Forest resources have been a valuable source of natural products for a long period of time to maintain human health, especially with more intensive studies in the last decade for natural therapies (Gisleneet al.,2000). Spices and herbs have been long used for thousands of centuries by many cultures to enhance the flavor and aroma of foods. Early cultures also recognized the value of using spices and herbs in preserving foods and for their medicinal value. Scientific experiments since the last 19th century have documented the antimicrobial properties of some spices, herbs and their components (Shelef, 1983; Zaika, 1988). The spices used in Indian cooking have been used since ages for adding flavor and also for house-hold treatment of infectious diseases. It is imperative to study their antimicrobial activity against the common

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Fermentation of Banana Must Using Mango Fruit Inoculums

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ABSTRACT

Wine was prepared from eight different varieties of banana (Khorikodu, Karpurchakra keli, Palaykondan, Alpan, Pisang celyan, Lamby, Karpurvali and Ardhapuri). Alcohol% of the wines produced using different varieties of banana were found to be in the range of 4.34 to 7.89. Highest Alcohol % observed was 7.89% in wine produced using ardhapuri variety. The Ardhapuri variety in which more alcohol production was found was used as reference in this study. This study was performed to investigate the effect of mango fruit must inoculum on fermentation of banana wine. The banana must was prepared from pulp of ripe banana fruits of Ardhapuri variety. Pectinase enzyme and potassium metabisulphite (KMS) were added to the juice. Then it was chapralized to 19°Brix. Diammonium phosphate (DAP) was added to this and pH adjusted to 3.5. The inoculum of banana juice and mango juice was used at a concentration of 10% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20°C for about 22 days. Physicochemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using banana juice and mango juice inoculum had °Brix (6.1 and 6.5), alcohol (4.38 and 4.24%) and titratable acidity (0.93 and 0.83%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different must inoculums.

Keywords: Banana must, banana wine, volatile acids, mango must

1. INTRODUCTION

Banana is one of the most important economic fruit crops. Because of high moisture content and textural characteristics, it is highly perishable in nature. By adopting proper post harvest management practices and processing into value added products, post harvest losses of banana can be reduced. Banana wine is a nutritious alcoholic beverage with low alcohol content. The cost of production of banana based alcoholic beverages is much cheaper than other fruit based beverages.

Banana fruit is having good amount of sugar which can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, grape, banana, pineapple, orange, coconut, mango and strawberry wine (Reddy et al., 2012; Shweta et al., 2016; and Ranjitha et al., 2015). Mango fruits are also one of the most common substrates for the production of fruit wine either by using

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Comparative HPTLC studies on Rhizome of Geographically isolated plants of *Zingiber officinale* Roscoe

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Abstract

The production of phytochemical compounds not only varies between varieties or species but also depends on external variables such as environmental conditions. The environmental condition can affect the phytochemical compositions of plants is the geographical location of growth. The active principles and other constituents of a number of medicinal plants are found to fluctuate with seasons and geographic regions. Therefore, considering same view, in the present work HPTLC chemical fingerprint of rhizome of (*Zingiber officinale* Roscoe) from Nanded district of Maharashtra and of Shimla, Himachal Pradesh were compared for their chromatogram variation. The densitometric analysis showed slight difference in the fingerprints of rhizome from both the locations. Rf values and peaks of densitogram also showed chemical variation. The rhizome of *Z. officinale* from Nanded showed nine phytochemical compounds and that of rhizome from Shimla showed eight compounds. HPTLC fingerprint analysis carried out without any standard was found to be informative enough to identify and to evaluate phytochemical variations present in between these two plants of *Z. officinale*.

Key Words: HPTLC, *Zingiber officinale*.

Introduction

Herbs and spices produce a different type of phytochemicals and secondary metabolites therefore they have been used not only as food preservatives and flavoring agents but also employed as medicine to cure different ailments. Medicinal plants play an important role in traditional health care systems as well as in international herbals and pharmaceutical markets (Talla et. al. 2013). Ginger (*Zingiber officinale* Roscoe) is an important tropical high valued medicinal plant, all across the world as a spice and for its therapeutic properties. It belongs to the family Zingiberaceae, which contains about 1300 species in 50 genera, along with four other families is positioned in the order Zingiberales which belong to class Monocotyledons (Ashraf et. al. 2017). The ginger is cultivated all over the world for its important rhizomes. Rhizome has lot of important medicinal properties. In Chinese, Ayurvedic, and Unani systems of medicine it is widely used in the treatment of ailments like arthritis, rheumatism, sprains, muscular aches, pains, sore throats, cramps, fever, infectious diseases and helminthiasis (Mustafa and Srivastava 1990). Rhizome of ginger can be used in majority of house hold remedies. It contains a number of different pungent and biologically active compounds mainly 6-gingerol, 10-gingerol, 8-gingerol, 6-shogaol, zingerone and paradol (Govindarajan, 1982). This different types of phytochemicals in ginger has known to possess antimicrobial and antifungal properties as well as several pharmaceutical properties (Park et. al. 2008). The characteristics phytochemicals produced by spices can be detected and studied by using modern analytical techniques such as spectroscopy, chromatography etc. In the

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PRELIMINARY PHYTOCHEMICAL SCREENING AND
PHARMACOGNOSTIC STUDIES OF *EUCALYPTUS RUDIS* ENDL.
(NILGIRI)

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Abstract

Eucalyptus rudis Endl. Commonly known as eucalyptus or flooded gum. Local name of eucalyptus is Nilgiri. The purpose of current study was identifying the primary phytochemicals and pharmacognostic studies of leaves and stem of *E. rudis*. *Eucalyptus* origin is Australia. Most of the species of eucalyptus found in Australia and Tasmania. The eucalyptus was rapidly distributed tropical and subtropical region of world. *Eucalyptus* belongs to the Myrtaceae family and more than 700 species found across the world. Plants are evergreen, large grow up to 45 to 50 m in height. The plant material collected from the different region of Nanded district of Maharashtra. Collected material shade dried and made it powder. The leaves and stem powder were successively extracted with methanol as a solvent. Soxhlet's extraction methods was used. In the present study of pharmacognostic investigation including morphology of plant, macroscopic, microscopic, fluorescence analysis and physico-chemical studies was done. In microscopic investigation stomatal number and stomatal index were done. For the anatomical studies were taking free hand sections of leaf and young stem. T. S. of leaf shows the single layer of epidermis both side of leaf and epidermis followed by cortex, endodermis, bicollateral vascular bundles and scattered secretory cavities. T. S. of young stem shows the primary growth, epidermis covered by thick cuticle, epidermis followed by the few layers of cortex, endodermis, bicollateral vascular bundles and centrally piths. In physico-chemical studies including moisture content, swelling index and foaming index were done and all the observation mentioned in results tables. Preliminary phytochemical screening of *E. rudis*, leaf and stem extract revealed the presence of alkaloid, flavonoids, saponins, triterpenoids, steroid, saponin, tannins, anthraquinone, phenol and carbohydrates, while the absence test of glycosides, fixed oil and coumarin. The findings of this study proved that the *Eucalyptus* plant contain many medicinally important components which helps to preparation of several drugs and treatment of various diseases.

Keywords: pharmacognostic study, *Eucalyptus rudis*, Nilgiri, phytochemical analysis of eucalyptus etc.

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Influence of different yeast strains on physicochemical characteristics of banana wine

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Banana must, banana wine, physicochemical characteristics, volatile acids and yeast strains

Abstract

Present study was carried out to investigate the effect of different yeast strains on fermentation of banana wine. The must was prepared from banana pulp of ripe banana fruits. For this pectinase enzyme and potassium metabisulphite (KMS) were added to juice. Juice was then chaptalized to 19 °Brix, Diammonium phosphate (DAP) was added to this and pH was adjusted to 3.5. The inoculum of activated yeast strains (*Saccharomyces cerevisiae* NCIM 3215 and NCIM 3604) were used at a concentration of 1% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20 °C for about 22 days. Physico-chemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using NCIM 3215 and NCIM 3604 strains had °Brix (6.1), alcohol (5.17 and 4.88%) and titratable acidity (0.93 and 0.96%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different yeast strains.

INTRODUCTION

Fermentation of fruit juice is a relatively simple way of reducing post harvest losses of primarily perishable fruits. One of such fermentation product is fruit wine. Wine is a fermentation product included in alcoholic beverage category and is produced by fermentation of fruit juice. The fruit having good amount of sugar can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, banana, pineapple, orange, coconut, mango and strawberry wine (Reddy *et al.*, 2012; Shweta *et al.*, 2016; and Ranjitha *et al.*, 2015). Banana fruit is commonly cultivated in a tropical region and is non-seasonal. Beside high production its post harvest losses are also more as it is also a perishable fruit. During fermentation process

various cultural parameters and nutritional requirements have fundamental role in the growth of microorganisms and subsequent product formation (Tambekar *et al.*, 2013, Nadagouda *et al.*, 2016). The influence of different yeast strains on production of banana wine is one of the aspects during fermentation of banana wine.

Various reports on production of banana wine are increasing day by day (Onwuka and Awam, 2001; Akubor *et al.*, 2003; Chersilp and Umsakul, 2008; and Isitua and Ibeh, 2010). However as per our knowledge very less work is reported in India which focuses on fermentation of banana wine by using different yeast strains as well as on physicochemical characteristics and volatile acid analysis of banana wines.





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Fermentation of banana juice using grape fruit juice inoculum

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Abstract

Present study was performed to investigate the effect of white grape must (WGM) and red grape must (RGM) inoculum on fermentation of banana wine. The banana must was prepared from pulp of ripe banana fruits. Pectinase enzyme and potassium metabisulphite (KMS) were added to the juice. Then it was chaptalized to 19°Brix. Diammonium phosphate (DAP) was added to this and pH adjusted to 3.5. The inoculum of WGM and RGM were used at a concentration of 10% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20 °C for about 22 days. Physico-chemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using WGM and RGM had °Brix (6.1), alcohol (4.38 and 4.24%) and titratable acidity (0.93 and 0.88%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different grape must inoculums.

Keywords: Banana must, banana wine, volatile acids, red grape must and white grape must

Introduction

Wine is a fermentation product included in alcoholic beverage category and is produced by fermentation of fruit juice. The fruit having good amount of sugar can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, banana, pineapple, orange, coconut, mango and strawberry wine (Roddy *et al.*, 2012; Shweta *et al.*, 2016; and Ranjitha *et al.*, 2015) [1], [7], [2]. Beside high production of banana fruit, its post harvest losses are more because of its perishable nature. Thus production of banana wine is one the alternative to prevent the postharvest losses of banana fruits. For this appropriate yeast inoculum should be used. Grape fruits are the most common substrates for the production of fruit wine either by using wild yeast present on the fruits or by adding suitable yeast starter. The fruit itself has plenty of fermenting normal flora which is used for production of wine. Thus we can employ grape fruits as a direct source of fermenting yeasts. Various reports on production of banana wine are increasing (Oruwaka and Awam, 2001; Akubor *et al.*, 2003; Cheirisp and Umsakul, 2008; and Isitua and Ibeh, 2010) [10], [1, 3, 5]. However as per our knowledge very less work is reported in India which focuses on fermentation of banana wine by using grape juice inoculum as well as on volatile acid analysis of such wines. With respect to this here we have made an attempt to investigate the effect of fermentation of banana wine by using grape juice inoculum on physicochemical parameters and volatile acid in banana wine.

Material and methods

Preparation of banana must

Ripe banana fruits were procured from local market of Nanded, Maharashtra, India. These fruits washed with tap water, hand peeled, cut in to thin slices and then grind in mixer. This pulp homogenate was then mixed with water in 1:1 proportion. To this 0.02% of pectinase enzyme to reduce the viscosity and 100 mg/L potassium metabisulphite (KMS), to kill the unwanted microorganisms, were added and the mixture was held at room temperature for 4 h. Pectinase treated juice was then chaptalized to 19°Brix using table sugar, DAP at a concentration of 100 mg/L was added to this and its pH was adjusted to 3.5 using citric acid and calcium carbonate. Then it was kept at 10 °C until required.



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Effect of must dilution on fermentation of banana fruit pulp into white wine

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Abstract

Preparation of a wine from the banana fruits was undertaken and effect of dilution on fermentation of banana wine was investigated. Must was prepared from healthy and ripen banana fruits which was inoculated with 2% (v/v) of yeast inoculum followed by fermentation. Physicochemical analyses of wines were then performed. Banana must with 1:0 and 1:1 dilution gives wine with 14% alcohol.

Keywords: banana wine, must dilution, fermentation

Introduction

Banana fruit has thick pulp and thus could not be fermented into desired product. Thus before fermentation the banana pulp must be homogenized and diluted with appropriate proportion of water. Effect of dilution and maturation on physico-chemical and sensory quality of jaman (Black plum) wine was reported by Joshi *et al.*, (2012)^[1], Ranjitha, *et al.*, (2015)^[2] standardized the process for production of banana wine by diluting the pulp in various ratios with water. Various reports on fermentation of banana wine are increasing day by day (Dwarika and Awam, 2001; Akubor *et al.*, 2003; Cheirsilp and Umsakul, 2008; and Isitua and Ibeh, 2010; Awe *et al.*, 2013)^[3, 4, 5, 6]. However as per our knowledge, research is lacking on effect of dilution of banana must in various proportions on fermentation of banana wine needs to be studied in detail. In view of this the present study was conducted to study the effect of dilution of banana must on fermentation of banana wine.

Material and Methods

Preparation of banana must

The fully ripened and undamaged banana fruits were purchased from the Local market of Nanded, Maharashtra during the month of May, 2015. The fruits were brought fresh to the laboratory and processed within two days. Must was prepared from healthy and ripen banana fruits. Banana fruits were washed with tap water and peeled manually. Pulp from each fruit was weighed, sliced into small pieces with a stainless steel knife and homogenized in a kitchen mixer. Pulp homogenate mixed with two part of hot boiled water (1:2, pulp: water (w/w)). Potassium metabisulfite (100 mg/L) was added to prevent the growth of unwanted microorganisms (Considine and Frankish, 2014) and kept for cooling at room temperature (26-28°C) for 2 h. The juice thus obtained was treated with 0.01 % (w/w) pectinase enzyme. Then this must was kept overnight for pectin hydrolysis at room temperature. This must was stored at 4 °C until required.

Effect of dilution

To study the effect of dilution on physicochemical characteristics of wine the must was diluted in following proportion with water; 1:0, 1:1, 1:2, 1:3 and 1:4 (must : water, v/v). The final volume of each mixture was adjusted to 20°Brix using cane sugar. pH was adjusted to around 3.40 using citric acid and diammonium phosphate was added to each flask at a concentration of 100 mg/L.

Fermentation process

For preparation of inoculum 6 g of Baker's yeast (*Saccharomyces cerevisiae*) was added to 300 ml of banana juice and incubated at 28-30 °C for 48 h. The must from each treatment was inoculated with 2 % (v/v) of inoculum containing 2.9×10^8 cfu/ml. The yeast cell count was done by using spread plate method on yeast extract peptone dextrose agar. Fermentation was carried out at room temperature (25-30 °C). Fermentation was allowed to complete for 24 d. Physicochemical analyses of wines were then performed.

Physico-chemical analysis

The pH of the must and wine was measured with a digital pH meter (Systronics, India), pre-calibrated with buffers of pH 4.0 and 7.0. Titratable acidity was determined by titrating with 0.1 N NaOH as described by AOAC and alcohol % was determined by using alcohol hydrometer as per the method described by Amerine and Ough (1980)^[7]. Total soluble solids (TSS) were determined using Abbey's refractometer (0-32) in terms of °Brix (Jacobson, 2006)^[8]. Volatile acidity was determined by titration of distillate samples and expressed as percent of acetic acid per 100 ml of wine.

Results and Discussion

Physicochemical characteristics of must

In present study to facilitate optimum fermentation,



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RESEARCH ARTICLE

NUTRITIONAL VALUE OF SUPERFOOD MORINGA TEA

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Abstract

Moringa (*Moringa oleifera*), family Moringaceae also called as a Drumstick tree belongs to a and this is fast growing, drought resistant annual shrub. It thrives in well drained loamy soils and its leaves are taken for preparation of various items. It also contains some medicinally important compounds known as, flavonoids, saponins, terpenoids compounds and other glycosides tannins. Nearly other parts of moringa like flowers, seeds, roots and pods, can be used in different industrial applications e.g. cosmetics, animal feed, human food etc. In this research paper it will be discussed methods for processing, preparation of moringa tea and its nutritional importance. It was also covered some health benefits related to human beings and market potential of moringa tea in Indigenous and global market in the upcoming years.

Keywords: Superfood, Nutritional Value, Moringa Tea, Health Benefits.

Introduction:-

Moringa (*Moringa oleifera*), family Moringaceae is a softwood, plant known as native of Indian sub continent, found wildly in the sub Himalayan regions of Northern India region and has grown worldwide in the sub-tropics and tropics regions. Moringa is an annual plant grows to Northwestern and Southern state of India and widely cultivated mainly in Maharashtra, Karnataka, Odisha and other states. Moringa known as the "drumstick tree" because of the shape of its seed pods. The drumstick or pod of moringa is a very popular and delicious used in the



Preparation of vermicompost enriched with microbial consortia for pomegranate plant (*Punica Grantum L*) cv Bhagawa

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Abstract:

The present investigation was carried out in pomegranate farm CV Bhagwa during the musq bahar (June 2023- December 2023), nutrient enriched vermicomposting was prepared using plant growth promoting microbes including *Bacillus Subtilis*, *azotobacter species*, *Frutewria Aurantia*, *Bacillus Polymixa*, *Pseudomonas Fluorescens*, *Trichoderma Viride*. These consortia were spraying on heap of vermicompost mixed it and allowed to incubate for 21 day in shady space at aerobic condition, after each fourth day interval spraying of water and mixing were carried out using turning of vermicompost for achieved maximum growth of plant growth promoting microbes in vermicompost, The selected farm of fourth eight plants of pomegranate were treated with three treatments T₁ (Organic manure 15 kg/plant + NPK 2kg/plant), T₂ (Organic manure 15 kg/plant +Vermicompost 2 kg/plant), T₃ (Organic manure 15 kg/plant +Vermicompost 2 kg/plant+ microbial consortia). The T₃ treatment gives significant results of the selected plant and shows that 28 days are required for initiation of the first flower bud as compared to other treatments (decrease day of initiation of bud). The all selected plants of treatment T₃ (Organic manure 15 kg/plant +Vermicompost 2 kg/plant + microbial consortia) gives average weight of fruit is 260 grams, it also shows that plant developed resistance against fungal and nematode infection furthermore required less chemical pesticides as compared to T₁ and T₂. It was concluded that the consortia of microbes in a vermicompost gives plant growth promoting substances and increases plant defence system against plant pathogens, hence this is an alternative and eco-friendly method for increasing soil fertility, maintaining microflora in rhizosphere soil and receiving safe food for human beings.

Key words: Vermicompost, consortia, aerobic, pesticides, rhizosphere



ANTAGONISTIC ACTIVITY OF ENDOPHYTIC FUNGI ISOLATED FROM ADHATHODA VASICA

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ABSTRACT

Eight endophytic fungi were isolated from the leaves and stems of *Adhathodavasica*. Among them *Alternaria* and *Penicillium* were dominant. These endophytic fungi inhibited growth of plant pathogens indicating their antifungal activity.

Key words: *Adathoda vasica*, Endophytic fungi, Antagonism

Introduction

Plants are considered as one of the important sources of biologically active compounds. Several plant species have been utilized globally in traditional healing and have been studied extensively for their pharmacological properties. Medicinal plants host some fungi that are involved in the co-production of active metabolites (Alvin and Neilan, 2014). These fungi may also contribute to the biological activities exhibited by the plants.

The microbes residing in the internal parts of plant tissue are called endophytes, which protect plants from herbivores, insect attacks or pathogens invading tissues and thus show mutualistic, parasitic and commensalistic relationship with the host (Singh et. al, 2011). They are responsible for resistance mechanism, to protect host plant from pathogenic invasion, by producing secondary metabolites having antagonistic activity. They have an ability to produce bioactive compounds which are associated with defense mechanisms of the plants (Arnold, 2003). Thus the endophytic fungi are considered as reservoir of active metabolites that can be used in drug development (Strobel, 2003, Owen and Hundley, 2004).

The presence of endophytic fungi in plant tissues was discovered more than 75 years ago from *Lolium* grass (Sampson, 1935). Attempts were made during present investigation to isolate endophytic fungi from a

medicinal plant, *Adhatoda vasica*, and to evaluate antagonistic activity of the isolates against plant pathogens

Material and Methods:

Isolation

The sampling procedure was designed with the intention of isolating as many endophytic fungal species as possible from different tissues. Leaves and stem portions were collected from well matured healthy plant of *Adulsa (Adhatoda vasica)*, stored in sterile polythene bags and used to isolate endophytic fungi. Leaf discs (0.5 cm diameter) and segments (0.3 to 0.5 cm) of stem portion were separated using sterile scalpel. Segments were surface sterilized by consecutive immersion for 1 minute in 75% ethanol, treated for 1 minute in 0.1% mercuric chloride followed by several washings in sterile distilled water. The time of the dilution and immersion in ethanol and mercuric chloride varied with tissues and host (at least three washing were require). Under sterile conditions, tissue segments were allowed to surface-dry before plating. The surface sterilized samples were placed on pre-sterilized potato dextrose agar (PDA) medium, supplemented with streptomycin (100 µg/ml), under aseptic conditions. The dishes were sealed with para film and incubated at 27±2°C for 2-4 days. The plates were continuously monitored for spore formation. Fungal isolates were stained with lactophenol




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Role of Arbuscular Mycorrhizal Fungi in plant health and Seasonal comparative analysis of its occurrence on some selected plant species

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Abstract

The present paper deals with the beneficial role of arbuscular mycorrhizal fungi in plant health and study of seasonal analysis of occurrence of arbuscular mycorrhizal fungi in the root and rhizospheric soil of some selected plants. The plants were collected on seasonal basis and all collected plant species showed mycorrhizal infection. Maximum root colonization was recorded in summer season and minimum in rainy season. The rhizospheric soils of the collected plant species were with AM fungal spores found highest in winter season while lowest in summer season. The percentage of colonization was varied with plant species. The AMF genus from the site noticed was genus *Glomus*, *Acaulospora*, *Enterospora*, *Gigaspora* etc with maximum number of species. Glomeromycota was the fungi found to be dominating in present work.

Keywords: Arbuscular, colonization, Glomeromycota

1. INTRODUCTION:

Mycorrhizae are a lead soil microbial component that plays a vital role in recovering deteriorated ecosystems [1] Nearly 80% of terrestrial plants develops useful plant growth responses as a result of its symbiotic association with mycorrhizal (AMF) Arbuscular mycorrhizal fungi [2]. Arbuscular mycorrhizal fungi are the most common form of symbiosis. The arbuscular mycorrhizal fungi (AMF) are observed to be present all over the world particularly in the soil. The arbuscles are considered the major site of nutrient transfer to the plant [3,4]. AMF facilitates host plants to grow vigorously under stressful conditions leading to enhanced photosynthetic rate, increased water uptake, and gas exchange-related traits [5] AMF forms vesicles, arbuscles, hyphae in roots, and spores and hyphae in the rhizosphere. Different kinds of spores, like chlamyospores, zygosporangia, etc. These spores were observed to remain in contact with a large number of plant communities like Bryophytes, Pteridophytes, Gymnosperms, Angiosperm's from all over the geographical areas [6] Plant growth is upgraded due to the formation of a hyphal network by AMF with plant roots, as this notably increases the access of roots to a large soil surface area [7]. The plant health is improved

A BRIEF REVIEW ON ETHNOMEDICINAL PLANTS USED BY TRIBAL HEALERS FOR THE MAINTENANCE OF PRIMARY HEALTHCARE IN INDIA

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Abstract:

The traditional medicine based on ethnomedicinal plants in India presents a strong relationship belonging to natural remedies, health, diet, and folk healing practice recognized by tribal healers. The present study aims to carry out an ethno-botanical review on medicinal plant species used by tribal healers in India including information on plant species, plant parts used, mode of preparation as well as medical uses. Earlier published data in research journals, textbooks, websites, and databases written in pharmacological evidence of Indian ethnomedicinal plants were based on gathering information. The present review work reported that 58 plant species belonging to 30 different families have been used by Indian tribal healers. Fabaceae has the highest number of plant species (07) followed by Amaranthaceae and Euphorbiaceae with 04 plant species in each. The inventoried plant species in the current work are frequently used for the treatment of primary healthcare and to ensure the medication safety of tribal healers. The most used preparation method of plant drugs, which is used in Indian Alternative medicine was decoction and paste of plant parts. The leaves (36%), underground parts (root/bulb/tuber) (15%), bark (11%), fruit (7%), seeds (7%), latex (6%), and flowers (5%) were the most useful plant parts in natural preparation in Indian traditional medicine in a percentage as reported in the present review work. The studied ethnomedicinal plant species have been extensively effective medicines for diarrhea and dysentery, oral healthcare, snakebite and cuts, burns, and wound healing potential.

Keywords: Ethnomedicinal plants, tribal healers, primary health care.

Introduction:

India has a rich traditional plant-based knowledge of health care. Plant based herbal drugs are in great demand in both developing and the developed countries in primary healthcare due to their great efficacy and little or no side effects. In India, the indigenous system of medicine namely ayurvedic, sidha and unani have been in existence since several years. A large number of plants, plant extracts, decoctions, or pastes are used by tribal healers and folklore traditions in India for the treatment of diarrhea, oral problems, snakebites, cuts, and wounds [1-3]. Several tribal groups have been using several plants or plant products for medicinal preparations and these medicines are known as ethnomedicines [4]. It is estimated that around 200,000 plant species are known all over the world. The World Health Organization (1978), has estimated that 80% of the population in developing countries use traditional medicines, mostly plant drugs, for their primary health care needs [5]. In India, 65% of the population relies on ethnomedicine for their health care needs [6].

India is one of the twelve mega-biodiversity countries of the world, which having rich vegetation with a wide variety of plants with high medicinal values. Over 550 tribal communities are covered under 227 ethnic groups residing in about 5000 villages of India in different forests and vegetation types [7]. The uses of different parts of plants by the tribal healers of the plains or hilly areas in different aspects have been studied by several workers [8]. Our country has a vast ethnomedicinal and folklore wealth. The indigenous groups possess their own distinct culture, religious rites, food habit, and rich knowledge of traditional medicine [9]. Medicinal plants had a considerable global impact in recent years. Due to various human activities such as deforestation, urbanization, rapid industrialization, and other developmental activities causing a fast reduction in both natural vegetation and traditional culture in India [10].

Therefore, the current review was conducted to gather information about the ethnomedicinal plants used by tribal healers for the maintenance of primary health care, such as to highlight the description of medicinal plants including local name, the parts used, mode of consumption as well as traditional uses.

Materials and methods:

Study area:

India is a Southern Asia. It has the 2nd largest population in the world. Speaking of area, India is the 7th largest country in the world. It lies on the Indian Plate, which is the northern part of the Indo-Australian Plate. India spreads over an area of about 3.28 million sq. km. The mainland of India extends between 8°4' and 37°6' N latitude and 68°7' and 97°25' E longitude.

Data collection:

In the present brief review, the data collected from previously published research journals, textbooks, websites, databases and folklore information written in pharmacological profiles and traditional uses of Indian medicinal plants were checked for collecting information.

Results and discussion:

The fruits of the present review of ethnomedicinal plants used in traditional medicine in India are summarised in Table 1. The present survey reported that 58 plant species springing from 30 different families have been used in different continents of



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Role of Arbuscular Mycorrhizal Fungi in plant health and Seasonal comparative analysis of its occurrence on some selected plant species

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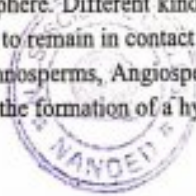
Abstract

The present paper deals with the beneficial role of arbuscular mycorrhizal fungi in plant health and study of seasonal analysis of occurrence of arbuscular mycorrhizal fungi in the root and rhizospheric soil of some selected plants. The plants were collected on seasonal basis and all collected plant species showed mycorrhizal infection. Maximum root colonization was recorded in summer season and minimum in rainy season. The rhizospheric soils of the collected plant species were with AM fungal spores found highest in winter season while lowest in summer season. The percentage of colonization was varied with plant species. The AMF genus from the site noticed was genus *Glomus*, *Acaulospora*, *Enterospora*, *Gigaspora* etc with maximum number of species. Glomeromycota was the fungi found to be dominating in present work.

Keywords: Arbuscular, colonization, Glomeromycota

1. INTRODUCTION:

Mycorrhizae are a lead soil microbial component that plays a vital role in recovering deteriorated ecosystems [1] Nearly 80% of terrestrial plants develops useful plant growth responses as a result of its symbiotic association with mycorrhizal (AMF) Arbuscular mycorrhizal fungi [2]. Arbuscular mycorrhizal fungi are the most common form of symbiosis. The arbuscular mycorrhizal fungi (AMF) are observed to be present all over the world particularly in the soil. The arbuscles are considered the major site of nutrient transfer to the plant [3,4]. AMF facilitates host plants to grow vigorously under stressful conditions leading to enhanced photosynthetic rate, increased water uptake, and gas exchange-related traits [5] AMF forms vesicles, arbuscles, hyphae in roots, and spores and hyphae in the rhizosphere. Different kinds of spores, like chlamydospores, zygospores, etc. These spores were observed to remain in contact with a large number of plant communities like Bryophytes, Pteridophytes, Gymnosperms, Angiosperm's from all over the geographical areas [6] Plant growth is upgraded due to the formation of a hyphal network by AMF with plant roots, as this



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A BRIEF REVIEW ON ETHNOMEDICINAL PLANTS USED BY TRIBAL HEALERS FOR THE MAINTENANCE OF PRIMARY HEALTHCARE IN INDIA

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Abstract:

The traditional medicine based on ethnomedicinal plants in India presents a strong relationship belonging to natural remedies, health, diet, and folk healing practice recognized by tribal healers. The present study aims to carry out an ethnohistorical review on medicinal plant species used by tribal healers in India including information on plant species, plant part used, mode of preparation as well as medical uses. Earlier published data in research journals, textbooks, websites, and databases written in pharmacological evidence of Indian ethnomedicinal plants were based on gathering information. The present review work reported that 58 plant species belonging to 30 different families have been used by Indian tribal healers. Fabaceae has the highest number of plant species (07) followed by Amaranthaceae and Euphorbiaceae with 04 plant species in each. The inventoried plant species in the current work are frequently used for the treatment of primary healthcare and to ensure the medication safety of tribal healers. The most used preparation method of plant drugs, which is used in Indian Alternative medicine was decoction and paste of plant parts. The leaves (36%), underground parts (root/bulb/tuber) (15%), bark (11%), fruit (7%), seeds (7%), latex (6%), and flowers (5%) were the most useful plant parts in natural preparation in Indian traditional medicine in a percentage as reported in the present review work. The studied ethnomedicinal plant species have been extensively effective medicines for diarrhea and dysentery, oral healthcare, snakebite and cuts, burns, and wound healing potential.

Keywords: Ethnomedicinal plants, tribal healers, primary health care.

Introduction:

India has a rich traditional plant-based knowledge of health care. Plant based herbal drugs are in great demand in both developing and the developed countries in primary healthcare due to their great efficacy and little or no side effects. In India, the indigenous system of medicine namely ayurvedic, sidha and unani have been in existence since several years. A large number of plants, plant extracts, decoctions, or pastes are used by tribal healers and folklore traditions in India for the treatment of diarrhea, oral problems, snakebites, cuts, and wounds [1-3]. Several tribal groups have been using several plants or plant products for medicinal preparations and these medicines are known as ethnomedicines [4]. It is estimated that around 200,000 plant species are known all over the world. The World Health Organization (WHO) has estimated that 30% of the population of developing countries use traditional medicines, mostly plant drugs, for their primary health care needs [5]. In India, 15% of the population relies on ethnomedicine for their health care needs [6].

India is one of the twelve mega-biodiversity countries of the world, which having rich vegetation with a wide variety of plants with high medicinal values. Over 550 tribal communities are covered under 227 ethnic groups residing in about 5000 villages of India in different forests and vegetation types [7]. The uses of different parts of plants by the tribal healers of the plains or hilly areas in different aspects have been studied by several workers [8]. Our country has a vast ethnomedicinal and folklore wealth. The indigenous groups possess their own distinct culture, religious rites, food habit, and rich knowledge of traditional medicine [9]. Medicinal plants had a considerable global impact in recent years. Due to various human activities such as deforestation, urbanization, rapid industrialization, and other developmental activities causing a fast reduction in both natural vegetation and traditional culture in India [10].

Therefore, the current review was conducted to gather information about the ethnomedicinal plants used by tribal healers for the maintenance of primary health care, such as to highlight the description of medicinal plants including local name, the parts used, mode of consumption as well as traditional uses.

Materials and methods:

Study area:

India is a Southern Asia. It has the 2nd largest population in the world. Speaking of area, India is the 7th largest country in the world. It lies on the Indian Plate, which is the northern part of the Indo-Australian Plate. India spreads over an area of about 3.28 million sq. km. The mainland of India extends between 8°4' and 37°6' N latitude and 68°7' and 97°25' E longitude.

Data collection:

In the present brief review, the data collected from previously published research journals, textbooks, websites, databases and folklore information written in pharmacological profiles and traditional uses of Indian medicinal plants were checked for collecting information.

Results and discussion:

The fruits of the present review of ethnomedicinal plants used in traditional medicine in India are summarized in Table 1.

The present survey reported that 58 plant species springing from 30 different families have been used in different continents of



ANTIFUNGAL ACTIVITY OF SILVER NANOPARTICLES SYNTHESIZED WITH THE HELP OF *FUSARIUM BRACHYGIBBOSUM*

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ABSTRACT

During present study, *Fusarium brachygibbosum* was isolated from the host plant *Maytenus emarginata* (Willd.) Ding Hou. and employed for biosynthesis of extracellular silver nanoparticles (AgNP). The size of the nanoparticles ranged from 15 to 60 nm. These silver nanoparticles were found to be effective against *Fusarium oxysporum*, *Fusarium solani*, *Alternaria solani*, *Alternaria alternata*, *Botrytis cinerea*, *Pythium aphanidermatum* and *Sclerotinia sclerotiorum*. With the increase in concentration of silver nanoparticles, the percent inhibition increased.

Key words: *Fusarium brachygibbosum*, silver nanoparticles (AgNPs), Antifungal, Phytopathogens.

Introduction:-

Various physical and chemical methods for the synthesis of nanoparticles have been suggested, however, it may lead to either contamination from precursor chemicals, as well as generation of hazardous by-products, which may cause environmental pollution (Sunkar and Nachiyar, 2012). In view of this present study was undertaken on bio-synthesis of silver nanoparticles (AgNPs) with the help of endophytic fungi as an alternative to the chemical method.

The AgNPs can be further used as an antimicrobial agents for the management of various plant diseases (Mishra *et al.*, 2012). During present study antifungal activity of AgNPs synthesized by using an *Fusarium brachygibbosum* isolated from a medicinal plant *Maytenus emarginata* (Willd.) Ding Hou.

Materials and methods:-

Plant parts such as stem and leaves of *Maytenus emarginata* (Willd.) were collected from parts of Nanded and Hingoli districts,

brought to the laboratory for the isolation of endophytic fungus, *Fusarium brachygibbosum*, following Hallman *et al.* (2007) and Selvakumar *et al.* (2014).

The plant samples were washed in running tap water, soaked in 0.1 % mercuric chloride, surface sterilized by using ethanol followed by 2% Sodium hypochlorite solution for 2-4 minutes and then dipped in distilled water. The plant parts were chopped into small pieces and inoculated in Petri dishes containing Czapadoux agar and potato dextrose agar (PDA) medium, supplemented with streptomycin. The Petri dishes were incubated at room temperature (28±2°C) for 10 days. The fungi, growing on the medium were sub cultured on separate Czapadoux agar medium, on plates as well as slants.

The fungi were identified based on their morphological features such as colony morphology, pigmentation, growth pattern, spore structures and other hypha characteristics following the relevant mycological literature and standard works of Nagamani *et al.*, (2006) and Barnett (1975) and confirmed by using 18S rRNA universal



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ANALYSIS OF WATER QUALITY USING PHYSICO-CHEMICAL PARAMETERS AT RATOLI VILLAGE.

Chemistry

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ABSTRACT

Water scarcity involves water stress, water shortage or deficit, and water crisis. This may be due to both natural and human factors. But, many reports suggest that the scarcity is more due to the human factor than anything – such as industrialization, irrigation, domestic use, etc. Unsafe drinking water is one of the main concerns in developing countries. Water supplies were sampled throughout the villages of this area mostly from boreholes, open wells, rivers and lakes as well as some piped waters. The samples were analyzed for their physical-chemical parameters and quality in order to identify the contamination problems and suggest appropriate solutions. Results of the assessment confirmed that in the studied area there are several parameters of health and aesthetic concern.

Water quality refers to the chemical, physical, biological, and radiological characteristics of water. It is a measure of the condition of water relative to the requirements of one or more biotic species and to any human need or purpose. It is most frequently used by reference to a set of standards against which compliance, generally achieved through treatment of the water, can be assessed. The most common standards used to assess water quality relate to health of ecosystems, safety of human contact, and drinking water. Generally we have survey of drinking water of some selected areas in Ratoli village having the population approximately 3500 and the chief sources of water supply are the Hand pumps, Bore wells, Wells, Ponds, Dam and River etc. The following parameters applied for monitoring of drinking water qualities for practical and study purposes. We are using some analytical parameter such as Temperature, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Alkalinity, Hardness and Fluoride quantity in drinking Water.

KEYWORDS

Water, Physico-chemical, Parameters, Water Samples.

Introduction:-

Water is life and no life can exist without water. So it plays an essential role in human life. The world health organization (WHO) report that 30% urban and 65% of rural Indian were without access to drinking safe water, 97% of the water on the Earth is salt water and only 3% is fresh water, slightly over two thirds of this is frozen in glaciers and polar ice caps. The remaining unfrozen fresh water is found mainly as groundwater, with only a small fraction present above ground or in the air. Fresh water is a renewable resource, yet the world's supply of groundwater is steadily decreasing, with depletion occurring most prominently in Asia, South America and North America, although it is still unclear how much natural renewal balances this usage, and whether ecosystems are threatened. The framework for allocating water resources to water users (where such a framework exists) is known as water rights. Groundwater is fresh water located in the subsurface pore space of soil and rocks. It is also water that is flowing within aquifers below the water table. Sometimes it is useful to make a distinction between groundwater that is closely associated with surface water and deep groundwater in an aquifer (sometimes called "fossil water"). People on globe are under tremendous threat due to undesired changes in the physical, chemical and biological characteristics of air, water and soil. Due to increased human population, industrialization, use of fertilizers and man-made activity water is highly polluted with different harmful contaminants. Natural water contaminates due to weathering of rocks and leaching of soils, mining processing etc. It is necessary that the quality of drinking water should be checked at regular time interval, because due to use of contaminated drinking water, human population suffers from varied of water borne diseases. The availability of good quality water is an indispensable feature for preventing diseases.

Inadequate water supply is still one of the major challenges in developing countries. The Joint Monitoring Programme (JMP) for Water Supply and Sanitation, implemented by the World Health Organisation (WHO) and UNICEF, reports that 783 million people in the world (11% of the total population) have no access to safe water, 84% of whom live in rural areas. About 187 million people use surface water for drinking purposes; 94% of them are rural inhabitants and they are concentrated in sub-Saharan Africa. At present, in Chad, Chad and Cameroon, it is estimated that 49% and 25% of the population has no access to improved water supplies respectively. Consequently, water borne diseases such as cholera and typhoid often

have their outbreak especially during dry season (Adenkunle et al.2004). High prevalence of diarrhea among children and infants can be due to the use of unsafe water and unhygienic practice. Diseases due to drinking of contaminated water leads to the death of five million children annually and make 1% of the world population sick (Shitta, Et al.2008). Also, water may contain toxic inorganic chemicals which may cause either acute or chronic health effects. Acute effects include rashes, lung irritation, skin rash, vomiting and dizziness, sometime death usually occurred. Chronic effect, like cancer, birth defects, organs damage, disorder of the nervous system and damage to the immune system are usually more common (Emh et al., 2002).

Methodology:-

It is very essential and important to test the water before it is used for drinking, domestic, agricultural or industrial purpose. Water must be tested with different physico-chemical parameters. Selection of parameters for testing of water is solely depends upon for what purpose we going to use that water and what extent we need its quality and purity. Water does contain different types of floating, dissolved, suspended and microbiological as well as bacteriological impurities. Some physical test should be performed for testing of its physical appearance such as pH, turbidity, TDS etc, while chemical tests should be perform for its BOD, COD, dissolved oxygen, alkalinity, hardness and other characters. For obtaining more and more quality and purity water, it should be tested for its trace metal, heavy metal contents and organic i.e. pesticide residue. It is obvious that drinking water should pass these earlier tests and it should contain required amount of mineral level. Only in the developed countries all these criteria are strictly monitored. Due to very low concentration of heavy metal and organic pesticide impurities present in water it need highly sophisticated analytical instruments and well trained manpower. Following different physico-chemical parameters are tested regularly for monitoring quality of water.

We have first randomly selected five area of Ratoli village as show in table-I, collected Drinking Water samples in Sterilized Bottles from various Water resources like as Hand pumps, Bore wells, Wells, Ponds, Dam and River etc. We have applied some physicochemical parameter for analysis of drinking water qualities. Temperature, Colour, Odour, pH, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Alkalinity, Hardness and Fluoride etc. first to know the Temperature of each samples at RT by thermometer in °C. Then by digital pH meter



Environmentally Benign Ionic Liquid 1-Butyl-3-Methylimidazolium Tetrafluoroborate an Efficient Reaction Medium for the One Pot Synthesis of Quinazoline Derivatives

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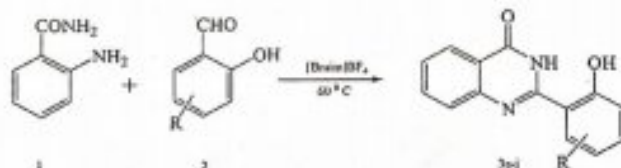
Abstract: Quinazoline derivatives were synthesized via two component one pot reaction of substituted salicylaldehydes, o-amino benzamide in presence of 1-butyl-3-methylimidazolium tetrafluoroborate afford the corresponding quinazoline derivatives. This method has the advantage of short reaction time, the mild reaction conditions, high yield of product, environmentally-friendly, reusability of the ionic liquids and easy work-up. Here the need of catalyst is avoided through the use of catalytically active ionic liquid as a solvent.

Keywords: Quinazoline derivatives, one pot synthesis, Catalyst-free, [Bmim]BF₄.

I. INTRODUCTION

In recent years, environmentally-friendly reaction processes have vigorously been considered from the point of view of green chemistry. For example reaction in aqueous media, oxidation reaction with the air etc. Most recently, ionic liquids have attracted as green reaction solvents for organic synthesis. Among the other ionic liquids based on 1-alkyl-3-methyl imidazolium salts, have drawn significant attention as an efficient and environmentally-friendly reaction media and have found huge application in various organic transformations such as Heck reaction¹, Hydrogenation², Bishler-Napieralski reaction³, Friedel-Craft reaction⁴, Allylation reaction⁵ etc. [Bmim]BF₄ shows tremendous application in various organic transformation.⁶⁻¹¹ 1-butyl-3-methylimidazolium tetrafluoroborate shows good thermal and electrochemical stability due to weak electrostatic interaction of tetrafluoroborate with the imidazolium cation. 1-butyl-3-methylimidazolium tetrafluoroborate are commercially available & the physicochemical properties like mild and neutral nature, lack of inflammability, low volatility, excellent solubility with many organic compound and environmentally-friendly make this ionic liquid superior than the other.¹²

Quinazoline based derivatives represent a significant class of heterocyclic compounds which contain two nitrogen in their nucleus and being the main constituents of many naturally occurring products, and have been of interest in recent years due to their useful biological and pharmacological features¹³. They possess a number of biological and therapeutic activities¹⁴⁻²³ such as anticancer, antiviral, antitubercular, anticonvulsant, anti-HIV, antioxidant, anti-inflammatory, antimicrobial, analgesic. Conventionally, this reaction was catalyzed by an acidic catalyst such as InCl₃ using acetonitrile as a reaction solvent²⁴. Recently, there are number of procedures²⁵⁻²⁷ reported in literature for the synthesis of these heterocycles using variety of catalysts and solvent. However, some of the reported methods suffered from number of drawback like prolonged reaction time, reagents in stoichiometric amounts, low yield, toxic solvents, and expensive catalysts. Consequently there is scope for further innovation towards shorter reaction time, milder reaction condition, to get high yield of product which is achieved by using 1-butyl-3-methylimidazolium tetrafluoroborate as a reaction media. So we describe herein new synthetic methods by using ionic liquids as reaction media for versatile, simple and environmentally-friendly synthesis of quinazoline derivatives (Scheme 01).



Scheme 01: Synthesis of quinazoline derivatives by using [Bmim]BF₄ as a reaction medium.

II. EXPERIMENTAL

21. Material and Methods

All chemical were purchased from sigma-aldrich and solvents were used without further purification. Melting point were determined in open capillary tube and are uncorrected. TLC & GC-MS used with E. Merck silica gel 60F glass plates. Column chromatography was performed on silica gel (90-140 mesh). ¹H-NMR spectra were recorded on advance 300 MHz spectrometer in CDCl₃ using TMS as an internal standard. Mass spectra were recorded on Polaris Q thermoscientific GC-MS. All products were characterized by comparison of their spectroscopic data (¹H-NMR, IR) and physical properties with those reported in the literature.



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IN-VITRO EVALUATION OF SELECTED CHLORO-CHALCONES FOR ANTIOXIDANT ACTIVITY

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Abstract : Synthetic chalcones having Chloro substituent (3a-3f) along with different functionality on the ring. Were examined in-vitro for their antioxidant abilities by DPPH (2,2-diphenyl-1-picryl hydrazine) radical scavenging activity and OH radical scavenging activity. The synthetic chloro-substituted chalcones were found to be reactive towards DPPH radical and also possess good to moderate OH radical scavenging activity. These findings suggest that these chloro-substituted chalcones can be considered as potential antioxidant agents which might be further explored for the design of lead antioxidant drug candidates.

Keywords - Chloro-chalcones, antioxidant, radical scavenging activity.

I. INTRODUCTION

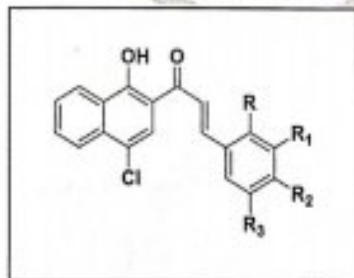
There is increasing experimental, clinical and epidemiological evidence highlighting an participation of free radicals and reactive oxygen species (ROS) in a variety of human diseases including cancer, inflammatory disorders and various degenerative ailments associated with aging.¹ Antioxidants are chemical substances, which scavenge free radicals and ROS thereby minimizing the burden of oxidative stress generated in the body.² Moreover, numerous experimental studies have suggested the importance of antioxidants as an alternative therapeutic approach for the treatment of several human ailments such as cardiovascular diseases, various types of cancer, and several inflammatory disorders.³⁻⁵

Antioxidants are compounds capable of preventing and even counteracting the damage caused in human tissue by the normal effects of physiological oxidation. A lot of research has shown that antioxidants can play a role in preventing the development of some chronic diseases. In addition to those mentioned previously, diseases such as atherosclerosis, emphysema, iron overload, malaria, muscular dystrophy, retinal degeneration, and rheumatoid arthritis are but a few examples where research has shown the likelihood of direct links and the possibility of positive dietary and perhaps even nutraceutical interventions.

Chalcones basic structure includes two aromatic ring bound by an α, β -unsaturated carbonyl group, a unique template associated with very diverse application.⁶ Due to the presence of the reactive keto, vinylic group, chalcones and their analogues have been reported to be antioxidant.⁷ Hydroxyl and phenyl substituents are associated with antioxidant properties. In the present investigation the antioxidant activities of selected chloro-substituted chalcones with various substituents attached are described.

II. EXPERIMENTAL

2,2-Diphenyl-1-picrylhydrazine (DPPH) was obtained from Sigma-Aldrich. glutathione (GSH) were obtained from s. d. Fine Chemicals Ltd. Mumbai. All other chemicals used were of AR grade and were obtained from commercial sources. The Synthetic chalcones under study were selected from the series of chloro-substituted chalcones which is synthesized. The details of the synthetic methodology and characterization of the test compounds has been reported elsewhere.⁸



3a. R= H, R₁= OCH₂CH₃, R₂= OH, R₃=H

3b. R= H, R₁=OCH₂CH₃, R₂= OH, R₃=Br

3c. R= O-CH₃, R₁=H, R₂= H, R₃=Cl

3d. R= OH, R₁=H, R₂= Cl, R₃=H

3e. R= OH, R₁= R₃= Br, R₂=H

3f. R= OH, R₁= R₃= I, R₂=H

General procedure

DPPH radical scavenging assay

100 μl of 0.1 mg/ml of test compound was added to 1 ml of 0.1 mg/ml DPPH solution in methanol. The mixture was allowed to stand for 30 minutes in the dark at room temperature. The absorbance was measured at 517 nm using a UV-Vis spectrophotometer.



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Development of environment Friendly Clean Agent for Replacement of Halons Used In Combat Tanks.

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Abstract

The present work is an effort to control the depletion of ozone layer by replacement of halons fire extinguishant used in combat vehicles with suitable environment friendly near equivalent clean alternatives. In this context other fire extinguishing agents like fluorocarbons having less ozone depletion potential have been experimented by using actual hazard volume of combat Tanks and observed that the effectiveness and capability of fluorocarbon fire extinguishing agents are near

Keywords: Halons, fire extinguishing systems, Hexafluorocarbon, Aqueous Film Forming Foam, Chlorofluorocarbons, Combat vehicles, Ozone depletion potential, Global warming potential, Montreal protocol, Fire detection and suppression system.

1. Introduction

Halon 1301 has been used for decades as the primary fire extinguishing material for a multitude of military applications. However, Halons have very high ozone depleting potentials which results in higher levels of ultraviolet radiation at Earth's surface and gives rise to serious health effects therefore its production was stopped in 1994 in most of the world. As per Montreal protocol use of Halons have been banned however developing nations are allowed to use Halons up to 2010 which has been further extended temporarily for its mission critical applications. Accordingly research initiated to identify and develop replacement agents and technologies to satisfy the performance requirements of fire protection in combat vehicles.

Halons are used in crew compartment, hand held extinguishers and engine compartment of Tanks. Accordingly this research will be based

on Halon elimination efforts in three separate grounds of combat vehicle applications. The research program is to identify alternatives to Halons used in fire extinguishing systems (FES) of Army ground based Combat tanks and trucks.

Based on the requirements, individual chemical agents having near equivalent fire extinguishing capability with low ozone depleting potentials have been experimented. Initial investigations indicated that a universal solution would not be available for drop in replacement of Halons. Accordingly it is decided to develop near equivalent clean agent having similar fire extinguishing property.

2. Synopsis

The research has been divided in three stages which are given as under-

STAGE - I Comprehensive study of near

C. S. P. Rathore, Dr. L. P. Shinde



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Nutritional and Economic Aspects of Quinoa (Chenopodium Quinoa)

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Abstract

Quinoa (*Chenopodium quinoa* Willd.), is considered as pseudo-cereal it has high nutritional values due to its exceptional protein quality and broad range of vitamins, minerals and amino acid balance. The quinoa protein is rich of amino acids like lysine and methionine that are deficient in cereal proteins. Quinoa grain is used to prepare flour, soup, breakfast, cereal and alcohol, while the flour is utilized in making of biscuits, bread and processed food. Quinoa starch has some functional properties like solubility, good water-holding capacity, gelation, emulsifying, and foaming that allow diversified industrial applications. Quinoa also contains various minor components like phytosterols and flavonoids etc. Besides, it has been considered an oil crop, with an interesting proportion of omega-6 and notable vitamin-E content. Quinoa milk and related food products are becoming popular throughout the world due to its good nutritional values and medicinal qualities. Quinoa milk is high in protein, low in fat and carbohydrate and contains no cholesterol. It is an excellent food for babies, children, elderly people and pregnant and lactating women. Due to diverse use of quinoa it is utmost important to grow quinoa to meet the requirement of the daily life of world population. In this study it is emphasised on economic and nutritional aspects of quinoa.

Keywords: Economic, Nutritive Aspects, Quinoa Milk, Quinoa Protein

1. Introduction

Quinoa is considered as pseudo-cereals grains. Quinoa grains have an established excellent nutritional food quality and it is also called the mother grain. Quinoa was the major crop of the pre-Columbian cultures in Latin America. Later, after the arrival of the Spaniards, quinoa cultivation was almost eliminated and only remained in the farmer's traditions. It has broad leaf plant with starchy dicotyledonous seed and therefore not a cereal. Quinoa is used in various cereal foods and also an important ingredient source of the

functional foods.

Quinoa's ability to produce high-protein grains under ecologically extreme conditions makes it important for the diversification of future agricultural systems, especially in high-altitude area of the Himalayas and North Indian Plains. The healthy lifestyle and appropriate nutrition are stressed nowadays. New foodstuffs are still investigated with the aim to improve the diet and conduce to a better health state of the population. Quinoa has high nutritious and dietary quality meets the demands of the food industry and

Subhash Chandra, L.P. Shinde



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Synthesis, UV Visible Spectroscopic Characterization and Antimicrobial Activity of Cu (II) and Ag (II) Metal complexes with 2-(4,5-dihydro-1H-pyrazol-5-yl) phenol.

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Abstract : In the present work the entitled ligand 2-(4,5-dihydro-1H-pyrazol-5-yl)phenol prepared by (E)-3-(dimethylamino)-1-(2-hydroxyphenyl)prop-2-en-1-one and phenyl hydrazine while its metal complexes (M = Cu, Ag) are prepared by refluxing in ethanol solution. The ligand and its metal complexes are characterised by UV Visible spectra, which suggesting M:L ration 1:2 and 1:1 for Cu(II) and Ag(II) metal ion chelate respectively.

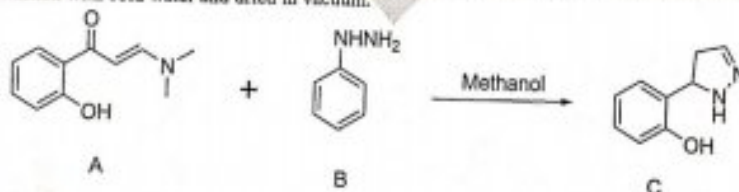
KEY WORDS :- Ligand, metal complexes and spectra.

INTRODUCTION

The Transition metals like Nickel, Copper, Zinc, Iron etc playing an important role in the various biological process occurs in the living organism like plants, animals, human etc. Haemoglobin carries oxygen to vital areas of body by binding it to the iron atom contained within it. Metal ions such as zinc provide the structural framework for the zinc fingers that regulates the functions of the genes in the nuclei of cells minerals containing calcium are the bases of bones, the framework of human body^{1,2}. Metals such as zinc, copper iron and manganese are incorporated into catalytic proteins which facilitate a number of chemical reactions needed for life. There has been enough interest organic ligand if at least one atom other than carbon forms a part of the ring system that it is designated as a heterocyclic compound¹. Pyrazol, which are five members two nitrogen containing heterocycle. Nitrogen, oxygen and sulphur are the most common hetero atom but heterocyclic rings containing O, N, S, donor atoms because of the variety of ways in which they are bonded to metal ion. Benzimidazole, pyrazole, isoquinoline, derivatives are the different types of heterocyclic used as anthelmintics. Albendazole is the most active benzimidazole antihelminthic drug¹⁰. Coordination compounds have been extensively used in industrial, biological, analytical, biochemical, clinical, antimicrobial³, analgesic⁴, antibacterial⁵, antihypertensive⁶ anticancer, antifungal and antitumor activity. The ligand plays an important role in complex formation, ligand act as electron donor to a single cation, they also acts as bridging groups to form stable metal chelates. The metal chelates depends on the affinity of metal ion reacts with towards chelating and its coordination⁷. The rapidly developing field of bioinorganic chemistry is centered on the study of coordination compounds present in living systems.

II. EXPERIMENTAL

Synthesis of Ligand: In the synthesis of 2-(4,5-dihydro-1H-pyrazol-5-yl)phenol (C), the equimolar mixture of (E)-3-(dimethylamino)-1-(2-hydroxyphenyl)prop-2-en-1-one (A) and phenyl hydrazine (B) are dissolved in a 30 ml Ethanol. The reaction mixture was stirred under reflux condition for 10 to 12 hour. TLC monitoring of the reaction showed complete transformation. After completion of reaction, mixture was poured into crushed ice. The resulting product having black colour were filtered off, washed with cold water and dried in vacuum.



Synthesis of metal complex (CuL₂) The Metal complex (CuL₂) i.e. bis(2-(4,5-dihydro-1H-pyrazol-5-yl) phenoxy)copper (D) is prepared by following method. A weighed quantity of ligand (0.02 mol) and metal chelate i.e. CuCl₂ (0.01 mol) were separately dissolved in 100 ml of ethanol solution. Clear solution of copper chloride and ligand solution were mixed in stoichiometric ration 1:1, the solution were reflux for two hours with constant stirring. The pH of solution was adjusted 6.0 to 6.5 by alcoholic ammonia. After cooling the resultant precipitate was digested for one hour. The precipitate was filtered, washed with hot ethanol (40-60 °C) and dried in vacuum desiccator over anhydrous granular calcium chloride and stored in a airtight glass bottle.

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Review Article

Open Access

Functional and nutritional health benefit of cold-pressed oils: a review

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Key Words: Cold pressed oil, Functional benefits, Nutritional benefits, bioactive compounds.

Abstract

Kachi ghani or cold pressed it means pressing the oil grains with force and oil is extracting. Its processed at lower temperature does not alter the properties of the oil which contains a higher phenolic content, flavour, aroma and nutritional value. The nutritionally valuable bioactive components of cold-pressed oils were presented such as: tocopherols, sterols, carotenoids and phospholipids with oxidizing properties partly removed from refined oils or destroyed during the industrial refining. Cold pressed oil does not contain trans fatty acids and are naturally cholesterol, it has great importance for cooking and skin care requirements. In the present study it was emphasized on functional food and nutritional characteristics of cold-pressed oils and the method of its extraction, factors influencing the quality attributes of the obtained oils were also discussed.

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Introduction

In recent years, the consumers are paying more and more attention to those aspects of their life which improves its quality. Therefore, the diet, in addition to the way and conditions of life, is one of the key factors influencing human health and well-being. The consumers for fear of chemical remnants in the food and those environmentally-conscious choose the oils unaffected by drastic thermal treatment. Recently, an increase in the consumption of

cold-pressed edible oils has been observed. In terms of nutritional values, these oils are more beneficial than the refined oil (Bartnikowska 2008; Matthaus & Bruhl 2008; Matthaus & Spender 2008; Przystawski & Boleslawska 2006). Cold-pressed oil has nutritionally valuable food components like tocopherols, sterols, carotenoids, phospholipids with oxidative properties which partly get exposed from refined oils or destroyed during the refining process (Wronink & Krygier 2006). The quality requirements imposed both by the



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Application of hazard and critical control point analysis (HACCP) in organic farming

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Key Words:
HACCP, organic
farming, quality.

Abstract

The primary purpose of this discussion paper on the integration of food safety management systems based on the Hazard and Critical Control Point Analysis (HACCP) with organic certification was to inform those within and outside the organic industry of recent developments in this area. It is also intended to highlight the need for the organic industry to address food safety management as part of the organic certification process. During the past two years, legislation and international demand in the marketplace for food safety management (complete with verification of the use of these systems) has led to a situation where it has become more a matter of 'how' than 'if'.

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Preferred citation: Chandra S, Dwivedi P, Saxena H & Shinde LP. 2020. Application of HACCP in organic farming. *Journal of Agriculture and Ecology*, 9: 1-20; <http://doi.org/10.53911/JAE.2020.9101>.

Introduction

While the origins of and motivations for the development of the organic industry worldwide are diverse, the industry has generally been supported by consumers who are concerned about avoiding the risks inherent in conventional means of food production (Morgan & Murdoch 2000). In order to protect consumers from fraudulent claims of organic practices being used during production, the labeling food as organic has become increasingly prevalent. In addition the audit and certification by a third party to

verify organic status of the product has become necessary. This certification is done in the context of a set of standards. During the past two decades, organic certification programs in India, and elsewhere, have proliferated in number as has the complexity of the standards applied. The organic philosophy contains a number of integrated ideological positions having to do with morality, environmental concern, health, and ecological feedback, which affect management decisions and economic analysis on the part of the grower (Parr et al. 1983).



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Short Communication

Comparison of solvent extraction and solid-phase extraction for the determination of polychlorinated biphenyls in transformer oil

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ABSTRACT

Solid-phase extraction (SPE) of nine polychlorinated biphenyls (PCBs) from transformer oil samples was evaluated using octadecyl (C18)-bonded porous silica. The efficiency of SPE of these PCBs was compared with those obtained by solvent extraction with DMSO and hexane. Average recoveries exceeding 95% for these PCBs were obtained via the SPE method using small cartridges containing 100 mg of 40 µm C18-bonded porous silica. The average recovery by solvent extraction with DMSO and hexane exceeded 83%. It was concluded that the recoveries and precision for the solvent extraction of PCBs were poorer than those for the SPE.

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1. Introduction

One important area of modern environmental analysis is the determination of polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs), both of which commonly occur in the environment. They are highly toxic, mutagenic and persistent in the environment, and therefore are on the US Environmental Protection Agency (EPA) list of priority pollutants (Mahindrakar et al., 2012). Polychlorinated biphenyls (PCBs) are chemical compounds which have been used as dielectric fluids in transformers and capacitors, as plasticizers and in hydraulic fluids (Berg et al., 1998; Bogdevich and Cadocinovic, 2004). PCBs are toxic, and they accumulate in soil, sediment and biota when they are released into the environment. Although most countries have strict regulations on the use of PCBs (UNEP, 2002), enormous amounts of PCBs did go into use before they were regulated. Indeed, they are still being used as insulators because devices such as transformers have lifetimes extending several decades. Many countries that have developed a classification system for PCB-containing fluids and materials have considered 50 mg kg⁻¹ as the benchmark level for PCB regulation (UNEP, 1999). In accordance with PCB management, analytical test methods for determination of PCBs in insulating oil have been published as ASTM-D4059, EPA-600/4-81-045 and NIST

(USEPA, 1982; ASTM D4059, 2000). In these methods, the oil, diluted with the appropriate solvent, is treated with acid and/or an adsorbent to remove interferences, and then analyzed by GC-ECD. However, the method detection limits (MDLs) of PCBs by these test methods are only 1–2 mg kg⁻¹ because the oil is diluted 50–100 times to minimize the influence of the oil during the analytical procedure (Yun-Cheol et al., 2008). PCBs are not easily separated from oil because the physical and chemical characteristics of PCBs are very similar to those of mineral oil. The components of oil-based liquid wastes co-elute with the PCBs during a GC separation and the baseline shifts due to the oil matrix. The key to lowering the MDL is to effectively remove the remaining oil during the analytical procedure. To remove the oil, a few analytical methods have been introduced to apply liquid-liquid partition using an appropriate solvent. Although these methods are useful in identifying and determining the PCBs in oil, the separation of PCBs by liquid-liquid extraction (LLE) is dependent on the skill of the analysts. To separate PCBs from oil matrix, researchers have used partition between non-polar solvent and non-proton polar solvent, such as dimethylsulfoxide (Orazio et al., 1989; Larsen et al., 1991; Mahindrakar et al., 2011a,b,c), acetonitrile (Gordon et al., 1987) and dimethylformamide (Lawn and Toffel, 1987). Solid phase extraction (SPE) system is also reported for concentration of sample (Kot-Wasik et al., 2004; Wojska et al., 2005; Conka et al., 2005). This method provides a powerful technique to overcome the drawback of LLE. A comparative study of the SPE technique

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Detection and Confirmation of Transfluthrin in Viscera- A Case Study

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Case Report

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Abstract

Mosquito repellents such as vaporizers, mats, coils and creams are being used in the household to reduce the risk of dengue, chikungunya and other infectious diseases. Nowadays liquid mosquito repellent is very common in the society due to easy availability, low cost and easy to use it remains available in most of the houses but its misuse in suicide/homicides cases cannot be ruled out. Toxicity of repellents results mainly in central nervous system (CNS) symptoms like headache, dizziness, drowsiness, status epilepticus and respiratory failure. A case of unknown poisoning was reported in 62 year old deceased and an empty repellents bottle was found at scene of crime. In this study various solvent systems have been tried to detect transfluthrin in biological material by using thin layer chromatography (TLC). It was observed that Benzene: Hexane (1:1) solvent system found very close Rf value with reference to standard transfluthrin in comparison to other solvent systems. The confirmation compound was carried out by FTIR and Gas Chromatography Mass Spectrometry (GC-MS) methods. The developed solvent system was found the quick, easy and cost effective for detection of transfluthrin in biological material. It has also been found that the concentration of the transfluthrin prevalent in the in the tissues of liver and kidney, lowest levels was found in the brain.

Keywords: Transfluthrin; Viscera; Case study; TLC; FTIR; GC-MS

Introduction

In India, the patterns of ingestion poison have been changed. The earlier days common poison like opium, arsenic, oleander and dhatura, etc. were used for poisoning purpose [1]. Nowadays it has been replaced by insecticides like organophosphorous, organochlorine, carbamate and pyrethroids [2-4]. Pyrethroids are effective pest control chemical with low mammalian toxicity are increasingly used in Indian agriculture and household purpose. Due to quarrel in the families are routine matter, but poisoning by transfluthrin in house is unusual thing [4,5]. Analysis of insecticides in body fluids is the choice of research from very long time before to know the impact of its on living beings.

The analytical methods of insecticides have been improved in last few years by advance and sophisticated techniques [6]. Amarnath, et al. have reviewed several techniques for the qualitative as well as quantitative analysis of insecticides ranging from conventional chromatographic methods to the modern GC-MS methods, in order to suggest a better, efficient, fast and result oriented method that can be utilized in future work of analysis [7]. The method of approach to an analysis of biological material for the presence of drugs depends very much on the type of material provided. Dhingra, et al. have detected ranitidine in visceral material by thin layer chromatography methods.

Transfluthrin (C₁₃H₁₂C₁₂F₄O₂; M.W: 371.15 g/mol

Detection and Confirmation of Transfluthrin in Viscera- A Case Study



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Int J Forens Sci

EVALUATION OF CLEAN AGENT FOR REPLACEMENT OF OZONE DEPLETING SUBSTANCE HALONS USED IN COMBAT VEHICLES.

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ABSTRACT

The present work is an effort to control the depletion of ozone layer by replacement of halons fire extinguishing agent used in combat vehicles with suitable environment friendly near equivalent clean alternatives. In this context other fire extinguishing agents like fluorocarbons having less ozone depletion potential have been experimented by using actual hazard volume of combat Tanks and observed that the effectiveness of fluorocarbon fire extinguishing agent 1,1,1,3,3,3 hexafluoroisopropane is having near equivalent fire extinguishing capability.

Key words: Halons, fire extinguishing systems, Hexa fluorocarbon, Aqueous Film Forming Foam, Chlorofluorocarbons, Combat vehicles, Ozone depletion potential, Global warming potential, Montreal protocol, Fire detection and suppression system.

INTRODUCTION

Halon 1301 has been used for decades as the primary fire extinguishing material for a multitude of military applications. However, Halons have very high ozone depleting potentials which results in higher levels of ultraviolet radiation at Earth's surface and gives rise to serious health effects therefore its production was stopped in 1994 in most of the world. As per Montreal protocol use of Halons have been banned however developing nations are allowed to use Halons up to 2010 which has been further extended temporarily for its mission critical applications. Accordingly research initiated to identify and develop replacement agents and technologies to satisfy the performance requirements of fire protection systems in combat vehicles.

Halons are used in crew compartment, and hull extinguishers and engine compartment offighting Tanks accordingly this research has been based on Halon elimination efforts in three separate grounds of combat vehicle applications. The research program is to identify alternatives to Halons used in fire extinguishing systems (FES) of Army ground based Combat tanks and trucks.

Based on the requirements, individual chemical agents having near equivalent fire extinguishing capability with low ozone depleting potentials have been experimented. Initial investigations indicated that a universal solution would not be available for drop in replacement of Halons. Accordingly it is

decided to develop near equivalent clean agent having similar fire extinguishing property.

SYNOPSIS

The research has been divided in three stages which are given as under-

STAGE - I Comprehensive study of near equivalent fire extinguishing agents.

The study was based a on review of the extensive research and engineering literature covering the physical and chemical processes active in flames and involved in flame extinguishment. Published lists of prospective Halon replacements have been evaluated. Ozone depletion potential (ODP), a useful metric found in regulatory legislation, has been examined in the light of recent work for alternative agents. Also Global warming potential (GWP), a measure of agent effect on climate, has been examined

STAGE -II Testing for fire extinguishing capability of agents for effectiveness.

The extinguishing concentrations of gaseous agents are determined by small-scale tests. Developmental testing of the most promising concepts, by simulating hazard area of of existing combat vehicles. Crew Survivability Criteria has been taken in to consideration for the minimum acceptable requirements of automatic fire extinguishing systems for occupied vehicle compartments.

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1. Physicochemical Characterization of Metal Complexes with Schiff Bases Ligands

B. G. Kharode¹, M. S. More¹, L. P. Shinde²

1. R. A. Arts, Shri M.K. Commerce and Shri S.R. Rathi Science College Washim (Ms)

2. N.E.S. Science College Nanded (Ms)

Abstracts

Physicochemical characterization of metals complexes with Schiff bases as ligand and its biological important in this paper different reactions are as follows In this reaction firstly amines and different aldehyde are reacts with one another to form Schiff bases and this followed by reacts with metals halide to form main products i.e metal complexes like this ways to form different metal complex

Keywords : Amine, aldehyde, sulphuric Acid, Ethanol, and metals halide.

Introduction

Firstly in this paper chemicals are used as i.e. amines, aldehyde reaction between two that reactant to form Schiff bases which is react with metals halide of different types to form metals complexes and then I have study of all product of FT IR, ¹H NMR, and Chemicals are used different types such as Amines, aldehyde, sulphuric acid, ethanol as a solvent, and metals halide.

Material and Methods

Scheme I

Step Ist:- Preparation of Schiff Base [*N*-(2-chlorobenzylidene)-2-methylbenzenamine]

It is the 1st step for preparation of *N*-(2-chlorobenzylidene)-2-methylbenzenamine

1.41 gm o-Chlorobenzaldehyde & 1.07 gm o-Toluidine were taken & mixed in the presence of 1-2 drops of H₂SO₄ in 15ml alcohol & resultant mixture was taken in mortar & pestle for grinding up to the solidify & cooled the precipitate & poured on to crushed ice.

The precipitate were filter & washed with distilled water recrystallization from ethyl acetate. Offered the purified Schiff base (*N*-(2-chlorobenzylidene)-2-methylbenzenamine)




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PHYSICOCHEMICAL CHARACTERIZATION OF METAL COMPLEXES WITH SCHIFF BASES LIGAND AND ITS BIOLOGICAL IMPORTANCE

B.G.Kharode¹, L. P. Shinde²

1. Department Of Chemistry, R. A. Art's, Shri M. K. Commerce and S. R. Rathi Science Mahavidyalaya Washim. (M.S. India).

2. Department Of Chemistry, Science College Nanded (M.S. India).

Abstracts:

In the given work we complexes of transition metal with Schiff base ligand. Initially Schiff base are synthesized from aromatic amine and aldehyde under acidic medium. All the synthesized compound show a good yield, and further it's prepared for biological activity. Characterization of metals complexes with ligand as Schiff bases and its biological important are described in this paper.

Keywords: Schiff bases, Aromatic amine, aromatic aldehyde, sulphuric Acid, Ethanol, and metals halide.

Introduction:

The Schiff base contain R-N=CH-R group obtain by primary condensation of aromatic aldehyde or ketone with aromatic amine in acidic medium are known as Schiff bases (SBs), and it is found that the substituted aromatic aldehyde and substituted aromatic base act as bi, tri dentate ligand to form a stable metal complexes with transition metal ion because of azomethine nitrogen atom and donor atom or group on aromatic ring which act as donor atom. Azomethine nitrogen chelating nature is responsible for stability of Schiff base metal complexes, and the chelating of azomethine and the halogen atom on the ring responsible for biological activity of metal complexes.

EXPERIMENTAL

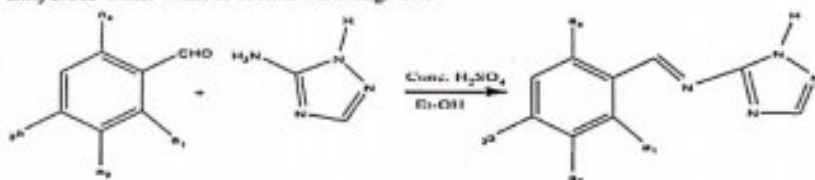
Material and Methods:

All solvents were laboured as commercial anhydrous mark without further Refining. The

column chromatography was carried out over silica gel (100120 mesh). Melting points determined by open capillary tube. ¹H NMR spectra were recorded on a Bruker 300 MHz spectrometer in CDCl₃ solvent TMS as internal standard. The crude product was recrystallizing from 80 percentage ethanol.

Step I: General Procedure for the synthesis of Schiff base:

A mixture of alcohol (20 ml) and aromatic aldehyde (0.02 mol) was taken into a 100 ml round bottom flask. The mixture was stirred until a homogeneous solution was obtained; aromatic amine (0.02 mol) was added with stirring. (As the reaction is exothermic it should be carried out by placing flask in a freezing mixture). Reaction mass is stirred for another 45 min. the Schiff base was precipitated out. The reaction mixture was cool with stirring. The isolated crude product is purified by the washing in acetone.



Scheme I

Compound also purify by silica gel column chromatography eluent ethyl acetate hexane reaction was. Monitored by TLC & spot were visualized in iodine.

Step II: -General Procedure for the synthesis of Metal Complexes with Co²⁺ Ion [MnCl₂ 4H₂O]

A mixture 0.1 mole of Schiff base in 30 ml alcohol and 0.5 mole of Cobalt chloride hex hydrate was stir to form a homogeneous



RESEARCH ARTICLE

NUTRITIONAL VALUE OF SUPERFOOD MORINGA TEA

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Abstract

Moringa (*Moringa oleifera*), family Moringaceae also called as a Drumstick tree belongs to a and this is fast growing, drought resistant annual shrub. It thrives in well drained loamy soils and its leaves are taken for preparation of various items. It also contains some medicinally important compounds known as, flavonoids, saponins, terpenoids compounds and other glycosides tannins. Nearly other parts of moringa like flowers, seeds, roots and pods, can be used in different industrial applications e.g. cosmetics, animal feed, human food etc. In this research paper it will be discussed methods for processing, preparation of moringa tea and its nutritional importance. It was also covered some health benefits related to human beings and market potential of moringa tea in indigenous and global market in the upcoming years.

Keywords: Superfood, Nutritional Value, Moringa Tea, Health Benefits.

Introduction:-

Moringa (*Moringa oleifera*), family Moringaceae is a softwood, plant known as native of Indian sub continent, found wildly in the sub Himalayan regions of Northern India region and has grown worldwide in the sub-tropics and tropics regions. Moringa is an annual plant grown to Northwestern and Southern state of India and widely cultivated mainly in Maharashtra, Karnataka, Odisha and other states. Moringa known as the "drumstick tree" because of the shape of its seed pods. The drumstick or pod of moringa is a very popular and delicious used in the

Physicochemical Characterization of Metal Complexes with Schiff Bases Ligand

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Abstract: In the present work first we synthesize Schiff base of some heterocyclic amine with aromatic amine, the chelating ability of Schiff base help to form metal complexes, and therefore Schiff base further react with metal ion to form metal complexes. The physical measurement and structural elucidation by spectrum like UV-Vis, FT-IR, ¹H-NMR, used in this work.

Keywords: Aromatic Amine, Aromatic Aldehyde, Sulphuric Acid, Ethanol, and Metals Halide.

I. INTRODUCTION

Both the Schiff base and metal complexes are important class of compound due to wide range of their biological activity and its biological importance. The compound obtain by direct condensation of aldehyde with primary aromatic amine are known as Schiff bases (SBs), the Schiff bases with bioactive metal such as Copper (II), Cobalt (II), Zinc (II), Manganese(II) form most stable complexes.

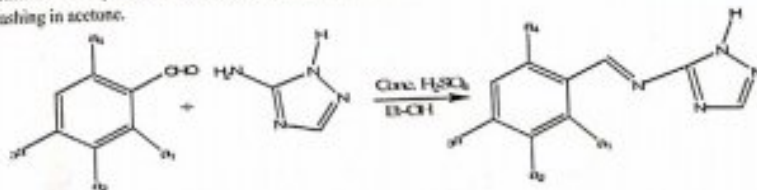
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Abstracts

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Keywords : Amine, aldehyde, sulphuric Acid, Ethanol, and metals halide.

Introduction

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The precipitate were filter & washed with distilled water recrystallization from ethyl acetate. Offered the purified Schiff base [*N*-(2-chlorobenzylidene)-2-methylbenzenamine]



An Efficient Protocol for Synthesis of 1,4-dihydropyridine Derivatives by Using Graphene Oxide Nano Particles as a Catalyst

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ABSTRACT

An efficient protocol was established for synthesis of 1,4-dihydropyridines via one pot condensation of aromatic aldehydes, β -dicarbonyl compounds and ammonium acetate at reflux condition by using Graphene Oxide nanoparticles as catalyst in ethanol. The advantages of this protocol includes high yields, recyclable catalyst, easy work-up and selectivity towards 1,4-dihydropyridine derivatives.

Keywords: 1,4-dihydropyridines, Graphene Oxide, Aromatic aldehydes and β -dicarbonyl compounds.

1. INTRODUCTION

1,4-Dihydropyridines (DHP's) are an important class of bioactive molecules first reported by Arthur Hantzsch in 1882 shows special biological activities in the treatment of cardiovascular diseases as a calcium channel blockers. 1,4-Dihydropyridines (DHP's) exhibits more than twelve commercial clinically important drugs such as Amlodipine, Nifedipin, Nimodipin, Felodipine, Isradipine and Nicardipin which are used worldwide¹. The derivatives

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Ionic liquid 1-butyl-3-methylimidazolium Bromide as a Green and Neutral Reaction Media for Catalyst Free Synthesis of 2-aminochromene Derivatives

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ABSTRACT

2-amino chromene derivatives were synthesized via three component one pot reaction of aldehydes, malononitrile and α/β naphthols by using 1-butyl-3-methylimidazolium bromide as a green and neutral reaction media at reflux condition. The mild reaction conditions, reusability of the ILs, easy work-up and high yields of products make the present procedure ecological and beneficial compared to conventional methods.

Keywords: Naphthols, 2-aminochromene, Ionic liquid, Reflux, Catalyst-free.

INTRODUCTION

Ionic liquids are salts consisting of ions, which exist in a liquid state at ambient temperature, and show reasonably high ionic conductivity. On the other hand, Ionic Liquids (ILs), having advantages such as indiscernible vapor pressure and excellent reusability, have been investigated widely in organic transformations as solvents or catalysts¹. Thus, various ILs have been used as reaction solvents as well as catalysts for green organic synthesis.

2-Amino-chromenes represent an significant class of compounds being the main constituents of many naturally occurring products, and have been of interest in recent years

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Simple and Efficient one Pot Synthesis of 3,4-Dihydropyrimidin-2(1H)-Ones and Thiones By Using A Mixture of Ionic Liquid And Graphene Oxide Nanoparticles at Reflux Condition.

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Abstract

A simple and efficient protocol was established for the one-pot Biginelli condensation reaction of aldehydes, β -dicarbonyl compounds, and urea or thiourea by using a mixture of [Hmim]HSO₄ and Graphene oxide nanoparticles as catalyst at reflux condition in ethanol. The advantages of this protocol includes high yields, recyclable catalyst, easy work-up and selectivity towards 3,4-dihydropyrimidin-2(1H)-onesderivatives

Keywords: Biginelli, Ionic liquid, Graphene Oxide nanoparticles, Reflux.

1. Introduction

Dihydropyrimidinones (DHPMs) were found to possess several biological activities such as antimicrobial, antiviral, antimalarial, anticancer, antihypertensive, anti-inflammatory, calcium channel modulators, mitotic kinesin inhibitors and neuropeptide Y(NPY) antagonists (Agrawal 2007; Rajesh 2011; Fewell 2004; Kappe 2000; Atwal 1991). The most simple and straightforward procedure, reported by Biginelli more than 100 years ago (Biginelli 1893; Dondoni 2006) involves the three component acid catalyzed condensation in one-pot, but this reaction suffers from the harsh conditions, long

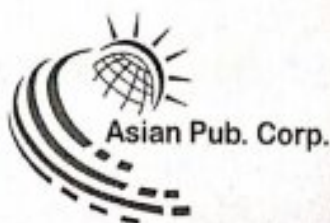
reaction times and frequently low yields. In recent years several literature citations exist relating to various efforts to develop the Biginelli reaction using alternative catalyst and greener methods such as ionic liquids, ultrasound irradiation [6], solvent free [7], catalyst free [8], aqueous media [9], metal triflate [10] and PINPs@GO [11]. Many of these reported methods involve the use of expensive reagents, hazardous solvents, long reaction times and tedious workup procedures. Presently, a mixture of [Hmim]HSO₄ and Graphene oxide has attractive features because of using minimum catalytic amount, reusability, recoverability and tolerable metal

Virbhadra G. Kalalawe, Dashrath R. Munde



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ARTICLE

Green and Efficient Synthesis of Xanthenes Derivatives using 1-Butyl-3-methylimidazolium Bromide under Solvent Free Condition

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ABSTRACT

A multicomponent condensation of aromatic aldehydes, β -naphthols and disulfoxide in 1-butyl-3-methylimidazolium bromide as a green catalyst produces xanthenes derivatives in good to excellent yield. Using 1-butyl-3-methylimidazolium bromide as a very efficient, convenient, economical, recyclable, green catalyst for the synthesis under solvent free condition has been developed. This method is environmental benign and advantageous compared to conventional methods because reusability of the ionic liquids, simple work-up and high yields of products.

KEYWORDS

β -Naphthols, Xanthenes, 1-Butyl-3-methylimidazolium bromide, Ionic liquid, Solvent-free condition.

INTRODUCTION

Xanthenes has paying substantial attention because they shows a number of biological activities such as antibacterial [1], anti-inflammatory [2], antiviral [3] also their pH sensitive fluorescent property used for the image of biomolecular assemblies [4], dyes [5,6], in laser technology [7,8]. Hence, synthesis of xanthenes derivatives are of a huge importance in biological and pharmacological studies.

It is well known that multicomponent reactions plays a significance role in modern organic synthesis. In multicomponent reactions three or more reactants are reacted in one pot to form a desired product without separation of intermediates and change of the reaction conditions. 1-Butyl-3-methylimidazolium bromide [Bmim]Br, have been employed as a promoter for environmentally benign alternative and ecological green catalyst in various organic transformations.

In recent years few methods have been developed for the synthesis of xanthenes derivatives using I_2 [9], chlorosulphonic acid [10], $Ca-SiO_2$ [11], $HClO_4-SiO_2$ [12], PWA [13], TCT [14], $InCl_3$ [15], strontium triflate [16], surfactant [17], SaSA [18], tungstosilicic acid [19]. However, these reported methods suffered from several drawbacks such as, prolonged reaction time, stoichiometric amounts of reagents, use of toxic solvents, low yields and difficulties in isolation of final products.

[Bmim]Br is a acidic ionic liquid and has been used for various organic transformations as catalyst, so the acidic nature




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Research Article

Synthesis of Acridine Derivatives Using Ionic Liquid as Promoter

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Abstract: A facile and convenient protocol for the synthesis of high yielding acridine derivatives has been developed by one-pot three component reaction of dimedone, aromatic aldehyde and ammonium acetate using ionic liquid.

Keywords: Acridine, dimedone, aromatic aldehyde, ammonium acetate

INTRODUCTION

The importance of heterocyclic systems that contain nitrogen is underlined by their key role in natural products. Acridines represent one of the most important subunits as their use as building block for heterocyclic systems and have a strong influence on many of the fields of medicinal chemistry¹. Multi-component reactions (mcrs) are important tools for the rapid and efficient synthesis of a wide variety of organic compounds. These reactions have been studied extensively in organic and diversity oriented synthesis, primarily due to their ability to complex molecular functionality from simple starting materials via one-pot reactions.

In recent years, extensive research on the synthesis of tricyclic compounds containing the 1,4-dihydro-pyridines, such as acridine derivatives, has been reported. Acridine derivatives have been



An efficient synthesis of Benzimidazole derivatives by using Metaltriflate catalyst in an aqueous media

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Abstract : Copper (II) Trifluoro-methane-sulfonate efficiently catalysed the synthesis of benzimidazoles and derivatives from o-phenyldiamine and substituted aldehydes in an aqueous media as a green solvent at reflux condition. This method provides a novel and efficient route for the synthesis of benzimidazole and benzthiazole derivatives in good to excellent yields with catalytic amount of Cu(OTf)₂.

Keywords : Metal Triflate, o-phenyldiamine, benzaldehyde, reflux.


Introduction:

Organic chemists synthesize hundreds of new heterocyclic compounds every week. In most cases the chemist has specific reasons for synthesizing a particular compound, usually based on theoretical considerations, medicinal chemistry, biological mechanisms or a combination of all three. The heterocyclic compounds are very widely distributed in nature and are very essential to living organisms. They play a vital role in the metabolism of all the living cells. Among large number of heterocycles found in nature, nitrogen heterocycles are the most abundant specially those containing oxygen or sulphur due to their wide distribution in nucleic acid illustration and their involvement in almost every physiological process of plants and animals [1]. Benzimidazole is a group of substances have found practical applications in organic synthesis and a significant structural element in medicinal chemistry owing to its diverse biological activities [2]. Benzimidazoles are also being developed as DNA minor groove binding agents with antitumor activity. These act as ligand to transition-metal for modeling biological systems [3].

A wide range of methods are available for the synthesis of benzimidazole derivatives including condensation of either o-phenylenediamine, o-aminobenzenethiol, and/or o-aminophenol with aldehydes, acid chloride, esters, carboxylic acids, and orthoesters in the presence of various acid catalysts [4-9]. Also, syntheses of these compounds have been reported using ILS [10-12]. In recent years, solvent-free synthesis of benzimidazole under microwave irradiation using Yb(OTf)₃ [13], KSF clay [14], Metal halide supported alumina [15] and solid support [16-17] has been reported. Although these procedures provide improvement, many of these catalysts or activators suffer from disadvantages such as the use of organic solvents or toxic reagents, harsh reaction conditions, long reaction time, need excess amounts of the reagents, and non-recoverability of the catalyst.

Taking in view of the applicability of heterocyclic compounds, the present work was undertaken to synthesize heterocycle like benzimidazole derivatives by using the Cu(OTf)₂ as a catalyst in an aqueous media as a green solvent (Scheme 01).




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An Efficient and Simple Method for Synthesis of 2-Phenyl-2,3-Dihydroquinazolin-4(1H)-Ones Catalyzed by Imidazolium Ionic Liquids

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Abstract: 3-carboxymethyl-1-methyl imidazolium trifluoroacetate ([Cmim] CF₃COO) ionic liquid catalyzed, an efficient method for the preparation of 2-phenyl- 2,3-dihydroquinazolin-4(1H)-ones by the one pot three component cyclocondensation of isatoic anhydride, ammonium acetate and aromatic aldehydes in ethanol : water solvent system. This procedure have several advantageous such as short reaction time, easy work up, excellent yields and reuse of ionic liquid.

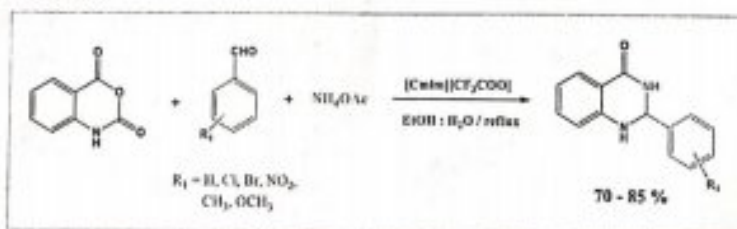
Index Terms: Isatoic anhydride, ionic liquid, ammonium acetate, 2,3-dihydroquinazolin-4(1H)-one

I. INTRODUCTION

Heterocycles formed by far the prevalent of the classical division of organic chemistry. Furthermore, they are of huge significance, not only both biologically and industrially but to the execution of any developed human society as well. Their contribution in a wide range of areas cannot be undervalued. The majority of the pharmaceutically products that mimic natural products with biological activity are heterocycles. Quinazoline is a heterocyclic compound made up of two fused six- membered simple aromatic rings, a benzene ring and a pyrimidine ring.

Medicinally quinazoline derivative has been used in various areas especially as an antimalarial agent and in cancer treatment. The various route for the synthesis of quinazolin derivatives includes the heating 2-acylanilides in the presence of ammonia or amines. [1] The attempt was made to prepare the synthesis of quinazoline derivatives by Niementowski in 1895. This involves reaction of anthranilic acids with amides to form 4-oxo-3,4-dihydroquinazolines or also known as quinazolinone derivative. [2] The condensation reaction of anthranilamide with aldehydes or ketone using p-toluenesulfonic acids as catalyst [3]. The reductive cyclization of o-nitrobenzamide or o-azidobenzamide with aldehydes or ketones [4] desulfurization of 2-thioxo-4(3H)-quinazolinones [5], a two-step synthesis starting from isatoic anhydride and amines, followed by annulation with ketones [6]. (c) reaction of isatoic anhydride with Schiff-bases [7], f) Condensation of anthranilamide with benzyl [8] and the condensation of isatoic anhydride, aldehydes and ammonium acetate or primary amine [9-10].

More attractive and convenient method for synthesis of such significant heterocycles is three-component condensation of isatoic anhydride, aldehydes, and ammonium acetate. The literature survey for this reaction covers the use of catalysts such as Al₂O₃ [11] Cation exchange resin [12], MCM-41-SO₃H [13], CAN [14], Zn (PFO)₂ [15], Solid phase synthesis [16], Sc(OTf)₃ [17], Amberlyst-15 [18] & silica -HClO₄ [19], [Bmim]BF₄ [20], Ga(OTf)₃ [21], K-10 [22], Bronsted acid catalyst [23], Heteropoly acid [24], Catalyst free and solvent free [25], B(HSO₄)₃ [26], SiO₂-ZnCl₂ [27], Cerous methanesulfonate [28], Thiamine hydrochloride (VB₁) [29], Clay supported heteropoly acid [30], TCT, PEG-400 [31], SPINOL phosphoric acid [32], Sc (III) inda-pybox [33], Cu-CNTs [34], Co-CNTs [35], Ag-CNTs [36], K₃PO₄ [37], SnCl₂ [38] However, many of these methods have its own advantages and disadvantages taking into consideration of disadvantages; such as long reaction time, low yields and use of large amount of catalyst therefore there is need to develop a method for one-pot synthesis of 2-phenyl- 2,3-dihydroquinazolin-4(1H)-ones.



Scheme: Reaction of isatoic anhydride, ammonium acetate and aldehyde for the synthesis of 2-phenyl-2,3-dihydroquinazolin-4(1H)-ones.

II. RESULTS AND DISCUSSION

Initially, to evaluate the efficiency and applicability of catalyst to synthesis of 2-phenyl- 2,3-dihydroquinazolin-4(1H)-ones, we choose isatoic anhydride (2mmol), benzaldehyde (2 mmol), ammonium acetate (3 mmol) as a substrates and 20 mol% of ionic liquid as catalyst proportion for model reaction. Successively, we focused our initial investigation on the effect of various solvents and their mixtures on model reaction at different temperatures (Table 1). It was observed that, the reaction doesn't march successfully in sole solvents like water, EtOH, acetonitrile and MeOH, but after prolonged stirring at room temperature

Synthesis of 1, 5-Benzodiazepine Derivatives Using Sulphated Tin Oxide as Solid Super Acid Catalyst

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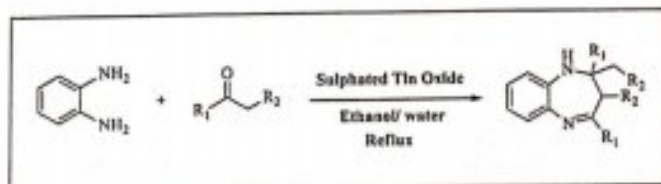
Abstract: A competent protocol for synthesis of benzodiazepine derivatives has been developed by condensation of *o*-phenylenediamine and various ketones using sulphated tin oxide as heterogeneous solid super acid catalyst in ethanol/water (1:1 v/v) at reflux condition. The synthesized catalyst was validated by Infrared spectra, X-ray powder diffraction, Scanning electron microscopic images and EDS maps. The optimization of reaction was carried for different solvents and loading of catalyst. The synthesized compounds were confirmed by spectral analysis. The method is advantageous in accordance with environmentally benign procedure, short reaction time, easy work up, reusable catalyst and high yields.

Index Terms: sulphated tin oxide, *o*-phenylenediamine, ketones, reflux

I. INTRODUCTION

Benzodiazepines are crucial nitrogen containing heterocyclic compounds that own a varied array of pharmacological and therapeutic properties. It's substantial central nervous system (CNS) depressant characteristic make benzodiazepines highly used psychotropic [1]. These are broadly worked as anti-anxiety, sedative, anticonvulsant, analgesic, hypnotic agents, anti-depressive and anti-inflammatory agents [2]. The 1, 5-dibenzodiazepines have been narrated to reveal inhibitory activities towards HIV-1 protease [3-4]. Fused ring structures like triazole, oxazine, and furanbenzodiazepines can be prepared from 1, 5-benzodiazepines synthens [5]. The compounds of 1, 5 benzodiazepines are moreover employed in Photography as dyes for acrylic fibers [6]. Due to their extensive applications, numerous approaches for the construction of benzodiazepines have been described by reaction between *o*-phenylenediamines (OPDAs) and enones, ketones, or β -keto ketones using several homogeneous catalysts such as $\text{BF}_3 \cdot \text{OEt}_2$ [7], NaBH_4 [8], polyphosphoric acid [9], solvent free under microwave irradiation [10], ZnCl_2 [11], $\text{Yb}(\text{OTf})_3$ [12], ionic liquids [13]. Along with that various solid acid as well as solid supported catalysts have been used for the synthesis of 1,5-benzodiazepines that includes sulfated zirconia [14], amberlyst-15 [15], stannic oxide NPs [16], polymer-supported FeCl_3 [17], $\text{Al}_2\text{O}_3 \cdot \text{T}_2\text{O}_3$ [18], Zeolite [19], H-MCM-22 [20], and $\text{Hg}(\text{OTf})_3$ [21]. However, all of these procedures have difficulties, which include costly reagents, extreme reaction conditions, comparatively extended reaction period, low yields, generation of unwanted products and difficulty in retrieval and reuse of the catalysts. Consequently, developing a novel approach for the scheming of 1,5-benzodiazepines in terms of being eco-friendly, simple and economically feasible is still of prime importance. To overcome all these limitations, development of green and environmentally sustainable synthetic methods is extremely required. Usually, heterogeneous catalysts offer various assistances such as modest reaction conditions, prodigious selectivity, great yields and ease of work-up processes. Recently organic transformations by using solid super acid catalyst are receiving a great importance. Among the several solid acid catalysts studied, sulphated tin oxide has fascinated much courtesy because of its low cost, super-acidity, and non-toxicity [22].

As a part of our research, here we validate the scheming of 1,5-benzodiazepines by applying sulphated tin oxide as catalyst through condensation of *o*-phenylenediamines with various ketones in ethanol/water at reflux condition (Scheme 01).



Scheme 01: Synthesis of 1,5-benzodiazepines

II. EXPERIMENTAL

2.1 Materials and Methods

All the reagents used were brought from Sigma Aldrich, SD Fine. Solvents utilized for chromatography were distilled to make them pure. The reactions were reviewed with TLC using aluminum plates coated by silica gel. Melting points of produced derivatives were assessed on Fisher John's apparatus. The synthesized derivatives were examined by ^1H NMR spectroscopy, Infrared spectra, ^{13}C NMR and Mass Spectrometry. IR spectra were recorded from a Perkin Elmer Spectrum RX FTIR (SAIF, Punjab University, Chandigarh) instrument. ^1H NMR was documented on a Bruker Advance II 400MHz Spectrometer (SAIF,



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Research Article

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A Novel Assent for Synthesis of Pyrazoline Derivatives by adopting Graphene Oxide Nanosheets as carbocatalyst at reflux condition

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Abstract: A novel route was amended for synthesis of 1,3,5- trisubstituted pyrazoline derivatives from substituted chalcones and phenyl hydrazine or hydrazine hydrate in ethanol by using Graphene oxide nanosheets as a heterogenous carbocatalyst at reflux condition. The reaction protocol gave 1,3,5-trisubstituted-2-pyrazolines in good yields via a one-pot addition cyclocondensation between aryl hydrazines and chalcones. The catalyst may be reused without showing much loss in the catalytic activity. The synthesized compounds were confirmed by their spectral data analysis.

Keywords: Pyrazoline, Chalcones, Graphene Oxide Nanoparticles, Reflux.

1. INTRODUCTION

Pyrazole is one of the most important five membered heterocycles containing two hetero atoms in its ring structure. Recently Syed Nazimuddin¹ and Maqdoom Farooqui¹ reported a simple convenient and high yielding synthetic route of some Pyrazole derivatives. Jaydip G. Rajpara *et al.*² reported One-Pot



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MEASUREMENT OF DENSITY, REFRACTIVE INDEX AND CONDUCTANCE OF SOME HETEROCYCLIC COMPOUNDS**P.M. Kadam^a and D. R. Munde^b**^aDepartment of Chemistry, Shri Vyankatesh Arts and Commerce College, Deulgaon Raja^bDepartment of Chemistry Science College, Nanded
pavankadam001@gmail.com**ABSTRACT**

2-(1H-benzo[d]imidazol-2-yl) quinoline derivatives were synthesized and characterized by M.P. Infrared spectroscopy, thin layer chromatography, ¹H NMR and mass data. Refractive index, molar refractivity and molar polarizability constant of synthesized compound have been studied in Ethanol, DMF, DMSO, and THF media at 303 K \pm 0.10 C temperature and different concentration (0.625x 10⁻³ to 10.0x 10⁻³ M). The values of molar refraction (R_m) and molar polarizability (α) constant are found to be decreased with decreasing concentration of solute in solvent. These parameters throw the light on the solute – solvent interaction and solute – solute interaction.

Keywords: Molar polarizability constant, Molar refractivities and density.

Introduction

Heterocyclic compound plays an important role in medicinal chemistry [1]. Benzo-fused azoles containing heterocyclic compounds are biologically active and medicinally significant compounds [2]. Among them, benzimidazole and benzothiazole structural motifs are found in a wide range of natural products [3,4] as well as in materials [5]. They also exhibit important biological activities such as anticancer [6], anti-HIV [7] and antibacterial.[8]. In spite of their biological importance, not many practical synthetic approaches have been reported in the literature [9]. Refractive index is an important additive property of a molecule. The refractive index is the ratio of angle of incident to the angle of refraction and it depends on the temperature and wave length of light. When a beam of light passes from rarer to denser medium such as from air to a glass or liquid, it bends towards the normal at the interface. This phenomenon is known as refraction. According to Snell's law of refraction the ratio of the sine of the angle of incidence and that of refraction is constant and is called as the refractive index of the liquid. It is given by formula $n = \sin i / \sin r$, where i is the angle of incidence and r is the angle of refraction. The refractive index of a medium is also defined as the ratio of velocity of light in vacuum to its velocity in given medium. The properties of liquid such as refractive index, ultrasonic velocity and

viscosity of binary mixture are studied by many workers [10,11]. A. N. Sonar et. al [12] has studied on viscosity, density and refractive index of substituted heterocyclic compounds in different media. S R Ingle and Y K meshram [13] has studied on additive properties of some simple heterocyclic drugs in different solvent by refractometrically. R. B. Dhake [14] studied on viscosity, density and refractive index of bicalutamide in mixed solvent at 303.15 K. S. K. Chavan and B. A. Gop [15] studied on refractive indices of 3-(4-fluorophenyl)-1-phenylprop-2-en-1-one in methanol and benzene mixtures 298 K. Sonune et. al. [16] has been studied additive properties such as molar refractivity and molar polarizability constant of allopurinol, acenocoumarol, warfarin and amoxicillin in different media. Syal et.al. has been studied the ultrasonic velocity and viscosity of PEG-8000, PEG-study of acoustical properties, viscosity coefficient of substituted heterocyclic compounds under suitable condition. The present work deals with the study of measurement of refractive index of 2-(1H-benzo[d]imidazol-2-yl) quinoline in different solvents was done by refractive index measurement different parameters such as molar refraction, polarizability and specific refraction have been calculated at 303 K and conductance was measured in DMF.




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1

Assessment of Water Quality of Vishnupuri Dam Using Physico-Chemical Parameters

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Research Paper - Chemistry

ABSTRACT

Drinking water is very vital problem in the developing country like India. Villagers in the country are mostly depends on bore wells, open wells, rivers and lakes for the drinking purpose. The water sample from Vishnupuridam were analyse for physico-chemical parameter in order to determine water quality and to find suitable solution. The results obtained are compare with standard values prescribed by WHO, ISI and ICMI. The sample were collected in winter, summer and rainy season. The investigation is useful for water quality assessment and management of Vishnupuri dam.

Introduction

Water is very vital important to survive living organism as well as their existence. People of Kaleshwar use water of Vishnupuri dam for various purposes as well as irrigational purpose. The physico chemical parameter is determined as per APHA (1998). Microbiological contamination of river, lakes and dams are very common in the developing country. Some observer have estimated that by 2025 more than half of the world will face water problem. Rapid urbanisation population explosion, industrialisation, agricultural practices have made water pollution a severe problem. Many parts of the world face scarcity of water. Waste water sewage is discharge into rivers, lakes and dam without




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SYNTHESIS AND SPECTROSCOPIC CHARACTERISATION OF CU (II) AND AG (II) METAL COMPLEXES WITH 2-(1H-BENZO[D]IMIDAZOL-2-YL)-4,6-DIIODOPHENOL

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ABSTRACT

In the present work the entitled ligand 2-(1H-benzo[d]imidazol-2-yl)-4,6-diiodophenol (L) prepared by orthophenylene diamine and 2-hydroxy-3,5-diiodobenzaldehyde while its metal complexes (M = Cu, Ag) are prepared by refluxing in ethanol solution. The ligand characterised by IR spectroscopy. The ligand and its metal complexes are characterised by UV Visible spectra, which suggesting M:L ratio 1:2 and 1:1 for Cu(II) and Ag(II) metal ion chelate respectively.

Key Words :- Ligand, metal complexes and spectra.

1.0] INTRODUCTION

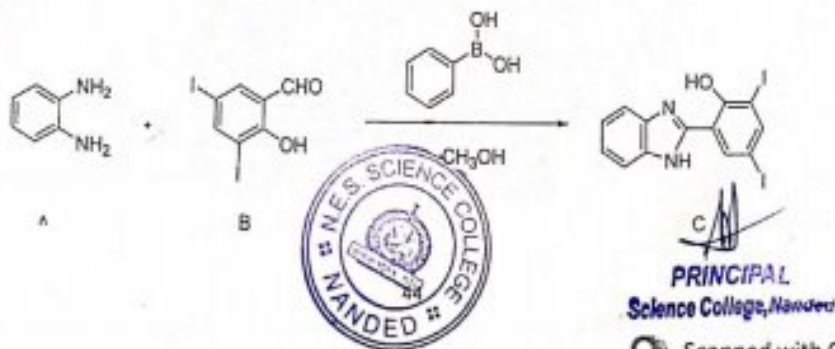
Metals perform a wide variety of tasks within human body. Haemoglobin carries oxygen to vital areas of body by binding it to the iron atom contained within it. Metal ions such as zinc provide the structural framework for the zinc fingers that regulates the functions of the genes in the nuclei of cells minerals containing calcium are the bases of bones, the framework of human body¹³. Metals such as zinc, copper iron and manganese are incorporated into catalytic proteins which facilitate a number of chemical reactions needed for life. There has been enough interest organic ligand if at least one atom other than carbon forms a part of the ring system that it is designated as a heterocyclic compound¹. Parasol, which are five members two nitrogen containing heterocycle. Nitrogen, oxygen and sulphur are the most common hetero atom but heterocyclic rings containing O, N, S, donor atoms because of the variety of ways in which they are bonded to metal ion. Benzimidazole, pyrazole, isoquinoline, derivatives are the different types

of heterocyclic used as anthelmintics. Albendazole is the most active benzimidazole antihelminthic drug¹⁰. Coordination compounds have been extensively used in industrial, biological, analytical, biochemical, clinical, antimicrobial², analgesic³, antibacterial⁴, antihypertensive⁵ anticancer, antifungal and antitumor activity. The ligand plays an important role in complex formation, ligand act as electron donor to a single cation, they also acts as bridging groups to form stable metal chelates. The metal Chelates depends on the affinity of metal ion reacts with towards chelating and its coordination².

2.0] EXPERIMENTAL

2.1. Synthesis of Ligand

In the synthesis of 2-(1H-benzo[d]imidazol-2-yl)-4,6-diiodophenol (C), the equimolar mixture of orthophenylene diamine (A) and 2-hydroxy-3,5-diiodobenzaldehyde (B) are dissolved in a 30 ml Ethanol with catalytic amount phenyl boronic acid. The reaction mixture was stirred



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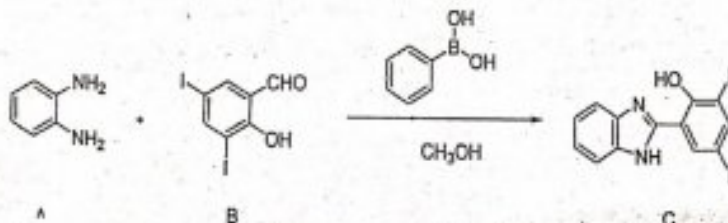
Metals perform a wide variety of tasks within human body. Haemoglobin carries oxygen to vital areas of body by binding it to the iron atom contained within it. Metal ions such as zinc provide the structural framework for the zinc fingers that regulates the functions of the genes in the nuclei of cells minerals containing calcium are the bases of bones, the framework of human body¹. Metals such as zinc, copper iron and manganese are incorporated into catalytic proteins which facilitate a number of chemical reactions needed for life. There has been enough interest organic ligand if at least one atom other than carbon forms a part of the ring system that it is designated as a heterocyclic compound¹. Parasol, which are five members two nitrogen containing heterocycle. Nitrogen, oxygen and sulphur are the most common hetero atom but heterocyclic rings containing O, N, S, donor atoms because of the variety of ways in which they are bonded to metal ion. Benzimidazole, pyrazole, isoquinoline, derivatives are the different types

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EFFECTIVE BIODEGRADATION OF FLURO SURFACTANT AND SODIUM DODECYL SULPHATE (SDS) FROM INDUSTRIAL EFFLUENTS BY USING THREE STAGE BIOREACTOR

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Abstract

Organic surface active agents like Fluoro surfactant and SDS are widely used in aqueous film forming foam (AFFF), detergent and cosmetic product formulations and they contribute significantly to the pollution profile of Industrial waste waters. Screening of Fluro surfactant and SDS degradation by using microorganism was carried out by the soil enrichment technique. The reduction of Fluro surfactant and SDS and COD in the synthetic wastewater by free cells of the Micro Organism was investigated. Free cells could degrade it up to $80 \pm 2\%$ of the 2400 mg/litre Surfactant and $70 \pm 4\%$ COD in the synthetic waste water at a residence time of 24 hours. The treatment of synthetic effluent with the application of the three stage bioreactor, involving aeration, adsorption with low cost scrap rubber granules and treatment with immobilized *Pseudomonas aeruginosa*. The three stage bioreactor showed an increase in the Surfactant elimination from $81 \pm 2\%$ to $99.8 \pm 0.1\%$ and COD reduction from $70 \pm 1\%$ to $99 \pm 1\%$ at a residence time of 24 hours in continuous treatment. The simplicity of the technique makes the process quite acceptable for industrial applications.

Keywords: Fluro Surfactant, Aqueous Film Forming Foam, Sodium Dodecyl Sulphate, *Pseudomonas Aeruginosa*, Three Stage Bioreactor, Scrap Granular Rubber, Immobilized Cells.

Introduction

Surfactants are organic compounds that reduce surface tension in water and other liquids (Kowalska et al .2004). In the Industrial wastewater produced by the Industry and households, surfactants are invariably exist in significant amounts. Surfactants have also been widely used in Aqueous film forming foam, textiles, fibers, paints, polymers, cosmetics, pharmaceuticals, mining, and oil recovery and paper industry. These applications of the surfactant resulting in their increased discharge into the wastewater produce foam and enter into the underground water resources. This constitute an ecological risk for aquatic organisms (Nasiruddin and Uzva , 2005). According to the charge of their hydrophilic moiety, surfactants can be classified into four categories: anionic, non-ionic, cationic and amphoteric (Mozia et al . 2005). Sodium Dodecyl Sulfate (SDS) selected for the present study is an example of anionic linear alkyl sulfate (Adacet et al. 2005).

Surfactant biodegradation has been the subject of substantial research since the 1950s when synthetic detergents came into widespread use. One such factor, particularly important in surfactant based processes, is the high concentration of surfactants involved. It is well documented that most commercial surfactants at low concentration range undergo and extensive biodegradation where that at higher concentration rarely undergo rapid degradation in an aerobic environment. But surfactants at much higher concentrations are commonly encountered in soil washing and other surfactant-based remediation technologies.

To improve the biodegradation of surfactants at higher concentration, biotechnological approaches may be applied to bring out efficient solutions for biological cleanup of industrial and domestic wastewater. In order to increase bacterial concentration in the bulk solution and to enhance biodegradation rates, membrane bioreactors have been successfully used by many investigators. (Mortazavi et al.2008). This work has been carried out with an objective of developing a suitable bioprocess for the effective biodegradation of fluoro surfactant and SDS at high concentration.



SYNTHESIS AND SPECTROSCOPIC CHARACTERISATION OF CU (II) AND AG (II) METAL COMPLEXES WITH 2-(4-HYDROXY-3-iodo-5-METHOXYPHENYL)-3-(PYRIDIN-2-YL)THIAZOLIDIN-4-ONE

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ABSTRACT

In the present work the entitled ligand 2-(4-hydroxy-3-iodo-5-methoxyphenyl)-3-(pyridin-2-yl)thiazolidin-4-one (L) prepared by 2-mercaptoacetic acid, 4-hydroxy-3-iodo-5-methoxybenzaldehyde and pyridin-2-amine while its metal complexes (M = Cu, Ag) are prepared by refluxing in ethanol solution. The ligand characterized by IR spectroscopy. The ligand and its metal complexes are characterized by UV Visible spectra, which suggesting M:L ratios 1:2 and 1:1 for Cu(II) and Ag(II) metal ion chelate.

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1. INTRODUCTION

There has been enough interest organic ligand if at least one atom other than carbon forms a part of the ring system that it is designated as a heterocyclic compound¹. Parasol, which are five members two nitrogen containing heterocycle. Nitrogen, oxygen and sulphur are the most common hetero atom but heterocyclic rings containing O, N, S, donor atoms because of the Variety of ways in which they are bonded to metal ion. Benzimidazole, pyrazole, isoquinoline, derivatives are the different types of heterocyclic used as anthelmintics. Albendazole is the most active benzimidazole antihelminthic drug². Coordination compounds have been extensively used in industrial, biological, analytical, biochemical, clinical, antimicrobial³, analgesic⁴, antibacterial⁵, antihypertensive⁶ anticancer, antifungal and antitumor activity. The ligand plays an important role in complex formation, ligand act as electron donor to a single cation, they also acts as bridging groups to form stable metal chelates. The metal

Chelates depends on the affinity of metal ion reacts with towards chelating and its coordination⁷.

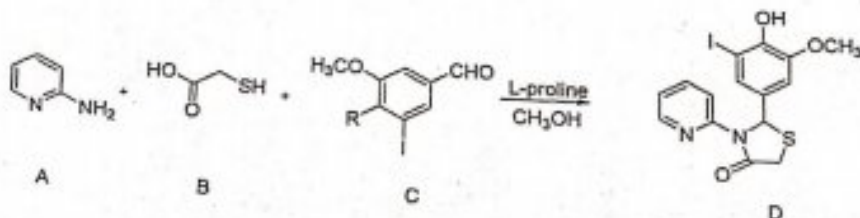
2. EXPERIMENTAL

2.1. Synthesis of Ligand

In the synthesis of 2-(4-hydroxy-3-iodo-5-methoxyphenyl)-3-(pyridin-2-yl)thiazolidin-4-one, 2-mercaptoacetic acid (0.46 ml), 4-hydroxy-3-iodo-5-methoxybenzaldehyde (1.30 ml) and pyridin-2-amine (0.48 ml) are dissolved in a mixture of 10 ml L-Proline and 30 ml Ethanol. The reaction mixture was stirred under reflux condition or appropriate time (4-6 min). After completion of reaction, mixture was poured into crushed ice. Finally the obtained precipitate was filtered and dries it.

2.2 Synthesis of metal complex Cu-L

The Metal complex bis(2-(4-hydroxy-3-iodo-5-methoxyphenyl)-3-(pyridine-2-yl)thiazolidin-4-one) (E) copper is prepared by following method. A weighed quantity of



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Microwave Assisted Synthesis and Antimicrobial Study of Some Novel 2-Azetidinones Derived from 2-(1-Phenylimino-ethyl)-naphthalen-1-ol

Salnath Zangade^{a*}, Avinash Shinde^b, Yogesh Nalwar^c, and Pravinkumar Patil^b^aU. G. Department of Studies in Chemistry, Madhavrao Patil ACS College, Palam, Dist. Parbhani-431720 (MS), India.^bDepartment of Chemistry, N.E.S. Science College, Nanded-431605 (MS), India.^cDepartment of Chemistry, Toshniwal ACS College, Sengaoan, Dist. Hingoli-431542 (MS) India.Article history: Received: 03 March 2019; revised: 11 April 2019; accepted: 16 April 2019. Available online: 04 July 2019. DOI: <http://dx.doi.org/10.17807/orbital.v11i3.1393>

Abstract:

Several substituted 2-azetidinone derivatives 2a-q have been synthesized from halogenohydroxy substituted imines 1a-q under microwave irradiation technique. The reactions were carried out using 2-methoxyethanol as an efficient reaction media to afford high yield of product. The structures of newly synthesized compounds have been established on the basis of elemental analysis, IR, ¹H NMR, ¹³C NMR, GC-MS and elemental data. Further, all newly synthesized compounds were screened for their *in vitro* antimicrobial activity. The antifungal and antibacterial effects of the tested compounds are due to their molecular structure and substituent present.

Keywords: 2-azetidinones; halogenohydroxy; Schiff bases; microwave irradiation; antimicrobial activity

1. Introduction

In recent years, focusing on green chemistry by using eco-friendly benign media and reaction conditions is one of the most interesting developments in synthesis of organic compounds. Microwave irradiation as an alternative and unconventional energy source has been increasingly used in organic synthesis [1]. Microwave-assisted organic synthesis could obtain rapid, reproducible, and scalable processes to prepare new compounds in high yields compared with the traditional heating methods [2]. It is reported that the organic compound was easily polarized to generate electronic polarization, atom polarization, orientation polarization and interfacial polarization in the microwave irradiation [3]. Also, electronic and atom polarization rates are much faster than the frequency of the microwave, and the other polarization rates are close to the frequency of the microwave [4]. Thus, microwave irradiation

resulting in the motion state of organic molecules was transformed from original thermal motion to alternating arrangement corresponding to the frequency of the microwave, oscillation intensifying, further generating thermal efficiency [5]. As a result, microwave irradiation as dielectric heating is a process in which the organic compounds consume electromagnetic energy, which can accelerate the reaction rate for several times, 10 times or even tens of thousands of times compared with the conventional heating [6].

2-azetidinones (β -lactam) are important classes of heterocyclic compounds and attractive targets both in medicinal chemistry and organic synthesis in recent years. Azetidinones, which are part of antibiotics structures, are known to exhibit interesting biological activities. A large number of 3-chloro monocyclic β -lactam possesses powerful antimicrobial, anticancer [7], cytotoxic [8], anticonvulsant [9] and antitubercular [10] activities. They also function as enzyme inhibitors

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A cleaner and convenient approach to Amines: Reduction of Symmetric diimines using NaBH_4

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Abstract

Symmetric diimines have been reduced to their corresponding amines by means of NaBH_4 using MeOH as a solvent at room temperature. The reaction time and yield are 1-1.5 hr and 65-80% respectively. Reduction process is very effective, inexpensive and clean for synthesis of diamines in good yield. The structures of the compounds are supported by FTIR, mass spectrometry, ^1H and ^{13}C NMR spectral data.

Keywords: NaBH_4 reduction, symmetric diamines, symmetric diimines, spectral data.

Introduction

Synthesis of amines has received more attention than the preparation of many other functional groups in organic chemistry.¹ With the growing repertoire of biologically relevant nitrogenous molecules, it is the need for efficient synthetic methods to prepare amines as useful intermediates.^{2,3} Due to their interesting physiological activities, secondary amines in particular are extremely important pharmacophore in numerous biologically active compounds, which have greatly been tested in the area of drug discovery.⁴ This field has also spurred intense activity on solid phase synthesis⁵ as well as combinatorial library generation where the secondary amines can be utilized as an important scaffolding for further manipulations.⁶

The reduction of imines is one of the most significant and useful method for preparation of the corresponding amines.⁷ Imines can be effectively reduced to amines by several reducing reagents.^{8,9} Sodium borohydride is a powerful reducing agent and has been employed in the reduction of a range of functional groups.^{10,11} In the present work an effort has been made to reduce some symmetric imines by NaBH_4 which is simple, safe and inexpensive reagent, and reduction can be achieved within 1-1.5 hrs.

Material and Methods

Melting points were determined in an open capillary tube and are uncorrected. The chemicals and solvents were of laboratory grade and were purified. Completion of the reaction was monitored by thin layer chromatography using hexane/ethyl acetate as mobile phase on pre coated sheets of silica gel-G (Merck, Germany) using iodine vapor for detection. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ^1H and ^{13}C NMR (70MHz) spectra were recorded in DMSO-d_6 with an Advance spectrometer (Bruker, Germany) at 400-MHz frequency using TMS as an internal standard. The mass spectra were recorded on

EISHIMADZU-GC/MS spectrometer. Elemental analyses were performed on a Perkin-Elmer 240 CHN elemental analyzer.

General procedure for reduction of bis-Schiff bases: Into a 100mL flask 0.01 mole bis-Schiff base (1a-k)¹² and 20mL MeOH were placed in an ice bath and 0.03 mole NaBH_4 was added pinch wise during 10 min. with stirring. After complete addition of NaBH_4 , the reaction mixture was further stirred at RT for 1-1.5hr. The progress of the reaction was monitored by TLC. The solid separated on evaporation of solvent was filtered, washed with cold water and recrystallized from ethanol to get 2a-k.

4,4-((propane-1,3-diybis(azanediy))bis(methylene)) bis(2-ethoxyphenol) (2a): White solid. Yield 80%, m.p.132-135°C; IR: $\nu_{\text{cm}^{-1}}$ =3420 cm^{-1} (OH), 3280 cm^{-1} (NH), 2928 cm^{-1} (-CH); ^1H NMR: δ /ppm=1.35(t, 6H, -2CH₃), 1.80 (m, 2H, -CH₂), 2.62 (t, 4H, -NCH₂), 3.80 (s, 4H, -CH₂), 4.10 (q, 4H, -2OCH₂), 4.61 (s, 2H, -2NH), 8.40 (m, 6H, 2Ar-H), δ 10.10 (s, 2H, 2Ar-OH); ^{13}C NMR: 18, 29, 46, 50, 65, 118, 120, 130, 136, 150; Anal Calc. $\text{C}_{21}\text{H}_{30}\text{N}_2\text{O}_4$ (374): C, 67.37; H, 8.02; N, 7.45. Found: C, 67.40; H, 8.31; N, 7.75.

4, 4-((propane-1,3-diybis(azanediy))bis(methylene))bis(2-bromo-6-ethoxyphenol) (2b): Faint brown solid. Yield 75%, m.p.127-130°C; IR: $\nu_{\text{cm}^{-1}}$ =3445 cm^{-1} (OH), 3320 cm^{-1} (NH), 2980 cm^{-1} (-CH); ^1H NMR: δ /ppm=1.40(t, 6H, -2CH₃), 1.91 (m, 2H, -CH₂), 2.65 (t, 4H, -NCH₂), 3.9 (s, 4H, -CH₂), 4.2 (q, 4H, -2OCH₂), 4.5 (s, 2H, -2NH), 8.6 (m, 4H, 2Ar-H), δ 10.2 (s, 2H, 2Ar-OH); ^{13}C NMR: 19, 30, 48, 52, 66, 119, 122, 133, 138, 155; Anal Calc. $\text{C}_{21}\text{H}_{28}\text{Br}_2\text{N}_2\text{O}_4$ (530): C, 47.54; H, 5.28; N, 5.28. Found: C, 47.40; H, 5.31; N, 5.20.

4,4-((propane-1,3-diybis(azanediy))bis(methylene))bis(2-ethoxy-6-iodophenol) (2c): White solid. Yield 75%, m.p.129-131°C; IR: $\nu_{\text{cm}^{-1}}$ =3443 cm^{-1} (OH), 3305 cm^{-1} (NH), 2965 cm^{-1} (-CH); ^1H NMR: δ /ppm=1.38(t, 6H, -2CH₃), 1.87(m, 2H, -CH₂), 2.70 (t, 4H, -NCH₂), 3.82 (s, 4H, -CH₂), 4.19 (q, 4H, -2OCH₂), 4.20 (s, 2H, -2NH), 8.5 (m, 4H, 2Ar-H), δ 10.14(s, 2H, 2Ar-OH); ^{13}C NMR: 19, 31, 48, 52, 65, 119, 120, 134, 137, 158; Anal Calc. $\text{C}_{21}\text{H}_{27}\text{I}_2\text{N}_2\text{O}_4$ (626): C, 40.25; H, 4.47; N, 4.28. Found: C, 40.10; H, 4.25; N, 4.30.

4,4-((propane-1,3-diybis(azanediy))bis(methylene))bis(2-methoxyphenol) (2d): White solid. Yield 85%, m.p.110-112°C; IR: $\nu_{\text{cm}^{-1}}$ =3428 cm^{-1} (OH), 3280 cm^{-1} (NH), 2943 cm^{-1} (CH); ^1H NMR: δ /ppm=1.72(m, 2H, -CH₂), 2.61(t, 4H, -2CH₂), 3.70 (s, 4H, -2NCH₂), 3.89 (s, 6H, -2OCH₃), 4.60 (s, 2H, -2NH), 8.22 (m, 6H, 2Ar-H), δ 10.05(s, 2H, 2Ar-




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Research article

Synthesis, characterization, spectroscopic studies and biological evaluation of Schiff bases derived from 1-hydroxy-2-acetonaphthone



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 Organic chemistry
 1-hydroxy-2-acetonaphthone
 1,3-diamines
 Schiff bases
 Antibacterial activity
 Antioxidant activity

ABSTRACT

The four Schiff bases (I–IV) were synthesized by the condensation reaction of 1-(1-hydroxynaphthalen-2-yl)ethanone, 1-(4-chloro-1-hydroxynaphthalen-2-yl)ethanone and 1-(4-bromo-1-hydroxynaphthalen-2-yl)ethanone with propane-1,3-diamine and pentane-1,3-diamine. The structural analysis is done by UV-vis, FT-IR, ¹H NMR, ¹³C NMR, LCMS and elemental analysis. These compounds were assayed for antibacterial (*Escherichia coli* and *Salmonella Typhi*) activity and antioxidant (2,2-Diphenyl-1-Picryl Hydrazyl (DPPH) and Hydroxyl radical scavenging method) activity. The antibacterial and antioxidant activities of synthesized Schiff bases exhibited better degree of inhibitory effects. Among these, Schiff base 2,2'-((propane-1,3-diylylbis(azarylylidene))bis(ethan-1-yl-1-ylidene))bis(4-chloronaphthalen-1-yl) (III) exhibited excellent antibacterial activity with MICs of 0.12, 0.25, 0.5 and 1 µg/ml against *E. coli* and *Salmonella Typhi*. Furthermore, two Schiff bases such as, 2,2'-((propane-1,3-diylylbis(azarylylidene))bis(ethan-1-yl-1-ylidene))bis(naphthalen-1-yl) (I) and 2,2'-((pentane-1,3-diylylbis(azarylylidene))bis(ethan-1-yl-1-ylidene))bis(4-bromonaphthalen-1-yl) (IV) exhibited promising antioxidant activity.

1. Introduction

Schiff bases contains azomethine (C=N) linkage and are usually derived by the condensation of carbonyl compounds (aldehydes/ketones) with primary aliphatic/aromatic/heteroaromatic amines. Schiff bases are known for their antitumor [1, 2, 3, 4, 5, 6, 7, 8], antifungal [9, 10, 11, 12, 13], antiviral [14], antibacterial [9, 10, 11, 12, 15, 16, 17] and anticancer [18, 19] activities. Schiff bases find many applications including acid catalyst [20, 21, 22, 23], reduction catalyst [24, 25], oxidation catalyst [26, 27, 28, 29, 30, 31], dye [32, 33] and it also exhibit special stability towards metal ions [34, 35, 36, 37]. The intermolecular hydrogen bonding ability and proton transfer equilibria of Schiff bases offer them excellent bioactivity [38]. Metal complexes derived from Schiff bases have been used as insecticides, pesticides, bactericides and fungicides [39, 40]. Furthermore, metal complexes of Schiff bases harbouring hetero atoms such as N, S, O etc. exhibit several bio potencies [41] including antitumor [42, 43], antioxidant [44], antibacterial [45, 46], antimalarial [47] antifungal [48], anticancer [49, 50, 51], antiviral [52], anti-inflammatory [53] and anti-HIV [54] activities. Infections with Gram-negative bacteria are especially worrisome than that of Gram-positive bacteria [55]. Considering the magnitude of ever-growing antibacterial resistance, it is necessary to discover novel Schiff bases with

resistance improved pharmacological profile. We chose to synthesize a library of Schiff bases from 1-hydroxy-2-acetonaphthone and diamines having 3-carbon spacer since it offers tetradentate and flexible nature to the new Schiff bases [56, 57, 58, 59, 60].

In present work, we report here in synthesis, characterization, antibacterial and antioxidant activity of four new Schiff bases derived from 1-(1-hydroxynaphthalen-2-yl)ethanone, 1-(4-chloro-1-hydroxynaphthalen-2-yl)ethanone and 1-(4-bromo-1-hydroxynaphthalen-2-yl)ethanone with propane-1,3-diamine and pentane-1,3-diamine. The structures of these Schiff bases were confirmed by UV, FT-IR, ¹H-NMR, ¹³C NMR, and Mass spectroscopic tools, and additionally by Elemental analysis.

2. Experimental

Chemicals were obtained from AURA, SPECTROCHEM & TCI and were used as received without any further purification.

2.1. Synthesis

The tetradentate Schiff base, 2,2'-((propane-1,3-diylylbis(azarylylidene))bis(ethan-1-yl-1-ylidene))bis(naphthalen-1-yl) (I) and 2,2'-((propane-1,3-diylylbis(azarylylidene))bis(ethan-1-yl-1-ylidene))bis(4-chloronaphthalen-

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Microwave-assisted synthesis of some new bis-1,3-benzoxazines and their antimicrobial activity

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Abstract: A series of bis-1, 3-benzoxazines (3a-f) were synthesized from reduced product of propane-1, 3-diamine Schiff bases in the presence of formalin under conventional heating and microwave irradiation. The structures of newly synthesized diamines and bis-1, 3-benzoxazines were established on the basis of spectroscopic data. Further, all the synthesized compounds were screened for antimicrobial activity. Some of the compounds showed very good activity compared to standard drugs against all pathogenic bacteria and fungi.

Keywords: Bis-schiff bases, bis-1, 3-propane diamines, microwave irradiation, antimicrobial activity. ©2020 ACG Publications. All right reserved.

1. Introduction

3, 4-Dihydro-2H-1,3-benzoxazines are bicyclic heterocycles that are of significant interest in the polymeric and pharmacological field. Benzoxazines are important class of benzfused heterocycles with wide spectrum of biological activity such as antimicrobial^{1,2}, analgesics³, antibacterial⁴, neuroprotective⁵, D₂ receptor antagonistic activity⁶, antimycobacterial⁷, antiviral⁸, antifungal activity⁹ these type of compounds have been important subject of researchers. In addition, N-substituted 3,4-dihydro-2H-1,3-benzoxazines are potential intermediates for the preparation of phenol formaldehyde resins¹⁰. Hence the synthesis of these compounds including attracted great interest. Several methods have been reported for the preparation of these compounds in literature for example, an important method was developed by using mannich-type condensations of phenol, with primary amines and two equivalent of formaldehyde¹¹. Condensation of *o*-aminomethyl phenol with an aldehyde or ketones provided another route¹². Reactions of primary amines with oxygen-containing dihalocompounds established a way to prepare 3,4-dissymmetric-substituted 3,4-dihydro-1,3-benzoxazines¹³. Recently, rhodium-catalyzed reactions of 2-(alkenyloxy)benzylamines have been developed as a way to generate 3,4-dihydro-1,3-benzoxazines an allylic cleavage followed by regioselective carbonylation at the internal carbon atom¹⁴. However, some drawback existed in previous methods. Moreover, the presence of some functional groups in the benzoxazine is incompatible with the use of this direct synthetic methodology. This is the case of the phenolic group that is desirable to prepare new polymeric materials with well-defined properties. This fact and the aim to prepare the bis-1,3-benzoxazine and its antimicrobial studies lead us to explore the utility of alternative synthetic routes.

The microwave induced enhancement of organic reactions is currently a focus of attention for chemists due to the decreased reaction time, improved yields and easier work up as compared to conventional methods¹⁵. In microwave synthesis, to avoid accidents low boiling, toxic and poisonous solvents are often avoided. The use of microwave for the synthesis of organic compounds has proved to

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IN-VITRO EVALUATION OF SELECTED CHLORO-CHALCONES FOR ANTIOXIDANT ACTIVITY

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Abstract : Synthetic chalcones having Chloro substituent (3a-3f) along with different functionality on the ring. Were examined in-vitro for their antioxidant abilities by DPPH (2,2-diphenyl-1-picryl hydrazine) radical scavenging activity and OH radical scavenging activity. The synthetic chloro-substituted chalcones were found to be reactive towards DPPH radical and also possess good to moderate OH radical scavenging activity. These findings suggest that these chloro-substituted chalcones can be considered as potential antioxidant agents which might be further explored for the design of lead antioxidant drug candidates.

Keywords : Chloro-chalcones, antioxidant, radical scavenging activity.

I. INTRODUCTION

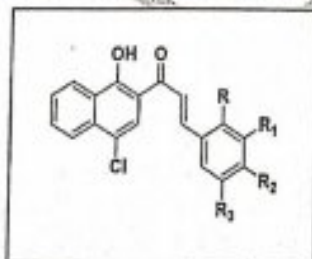
There is increasing experimental, clinical and epidemiological evidence highlighting an participation of free radicals and reactive oxygen species (ROS) in a variety of human diseases including cancer, inflammatory disorders and various degenerative ailments associated with aging.¹ Antioxidants are chemical substances, which scavenge free radicals and ROS thereby minimizing the burden of oxidative stress generated in the body.² Moreover, numerous experimental studies have suggested the importance of antioxidants as an alternative therapeutic approach for the treatment of several human ailments such as cardiovascular diseases, various types of cancer, and several inflammatory disorders.³⁻⁵

Antioxidants are compounds capable of preventing and even counteracting the damage caused in human tissue by the normal effects of physiological oxidation. A lot of research has shown that antioxidants can play a role in preventing the development of some chronic diseases. In addition to those mentioned previously, diseases such as atherosclerosis, emphysema, iron overload, malaria, muscular dystrophy, retinal degeneration, and rheumatoid arthritis are but a few examples where research has shown the likelihood of direct links and the possibility of positive dietary and perhaps even nutraceutical interventions.

Chalcones basic structure includes two aromatic ring bound by an α, β -unsaturated carbonyl group, a unique template associated with very diverse application.⁶ Due to the presence of the reactive keto, vinylic group, chalcones and their analogues have been reported to be antioxidant.⁷ Hydroxyl and phenyl substituents are associated with antioxidant properties. In the present investigation the antioxidant activities of selected chloro-substituted chalcones with various substituents attached are described.

II. EXPERIMENTAL

2,2-Diphenyl-1-picrylhydrazine (DPPH) was obtained from Sigma-Aldrich. phythione (GSH) were obtained from s. d. Fine Chemicals Ltd. Mumbai. All other chemicals used were of AR grade and were obtained from commercial sources. The Synthetic chalcones under study were selected from the series of chloro-substituted chalcones which is synthesized. The details of the synthetic methodology and characterization of the test compounds has been reported elsewhere.⁸



3a. R= H, R₁= OCH₂CH₃, R₂= OH, R₃=H
 3b. R= H, R₁=OCH₂CH₃, R₂= OH, R₃=Br
 3c. R= O-CH₃, R₁=H, R₂= H, R₃=Cl

3d. R= OH, R₁=H, R₂= Cl, R₃=H
 3e. R= OH, R₁= R₂= Br, R₃=H
 3f. R= OH, R₁= R₂= I, R₃=H

General procedure

DPPH radical scavenging assay



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Growth Inhibitory Properties of Synthetic Chalcones

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Abstract: *Background:* In the present study, chalcones were synthesized from 2-hydroxy-1-acetonaphthone and substituted aromatic aldehydes were synthesized by Claisen Schmidt condensation reaction using potassium hydroxide as a base. The synthesized chalcones were purified by recrystallization from ethanol and evaluated for antibacterial activity by well diffusion method. The antibacterial activity was evaluated against *Bacillus licheniformis*, *Bacillus species*, *Escherichia coli* and *Staphylococcus aureus* using Ciprofloxacin as a standard.

Methods: The target molecules were prepared by reacting 2-hydroxy-1-acetonaphthone and various substituted aromatic aldehyde in the presence of suitable condensing agents. The structure of synthesized compounds was confirmed on the basis of elemental analysis, IR, ¹H NMR and ¹³C NMR spectral data. These synthesized compounds were also screened for antibacterial activity.

Results: In the present study, free hydroxyl group in position 2 or 4 of aldehyde ring of synthesized chalcones appears to be a very important requirement in increasing the activity (2-5 and 8-13). When the hydroxyl group in position 4 is alkylated (14, 15), the chalcones become less active. When more complex substituent is present on the aldehyde ring (6, 7) there is a decrease in the activity.

Conclusion: Newly synthesized chalcones (1-15) show good and moderate antibacterial activity. We believe that the new hydroxy substituted (in aldehyde ring) chalcones (2-5 and 8-13) reported in this work may provide an interesting insight for further optimization.

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Keywords: 2-hydroxy-1-acetonaphthone, chalcones, antibacterial activity, Minimum Inhibitory Concentration (MIC), hybrid molecules, aromatic aldehydes.

1. INTRODUCTION

The discovery of antibiotics has long been regarded as one of the most significant medical achievements of the twentieth century. Antibiotics have saved millions of lives [1] and enabled important medical procedures, including surgery and cancer chemotherapy. The emergence and spread of antibacterial resistance in all geographical areas, including in bacteria that cause hospital- and community-acquired infections, is, however, jeopardizing the effectiveness of these potentially life-saving treatments [2]. The threat includes the spread of multidrug-resistant bacteria, and infections with no therapeutic options have been reported [3].

The number of life threatening infections caused by multidrug-resistant Gram-positive pathogens has reached an alarming level in hospitals and the community infections caused by these organisms create a serious challenge to the scientific community and the need for an effective therapy has lead to a search for novel antibacterial agents [4]. Antibacterial agents are among the most commonly used and

misused of all drugs [5] they reduce or completely block the growth and multiplication of bacteria. This has made them unique for the control of deadly infectious disease caused by a variety of pathogens [6]. Although deaths from bacterial infection have dropped in the developed worlds and these are still the major cause of death in the developing world. The inevitable consequence of the widespread use of antibacterial agents has been the emergence of antibiotic-resistant pathogens, fueling an ever-increasing need for new drugs. In the design of new compounds, development of hybrid molecules through the combination of different pharmacophore in one structure may lead to compounds with increased antibacterial activity.

Chalcones, considered as the precursors of flavonoids and isoflavonoids [7], are abundant in edible plants. Chemically they consist of three carbons α , β -unsaturated carbonyl system. Condensation of aromatic aldehydes with aromatic ketones in the presence of catalyst yields chalcones [8]. Chalcones commence a diversity of chemical reactions together with the synthesis of pyrimidine, isoxazoles and pyrazolines. Chalcones act as mediators in the synthesis of beneficial therapeutic compounds special attention has been given to chalcones due to their simple structure and diverse pharmacological activities including anticancer [9-11], antioxidant [12-14], anti-inflammatory [15, 16] antimicrobial

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Abstract: Background: Iodination of the organic substrate is an important reaction for the synthesis of pharmacologically active molecules.

Methods: In view of these concerns, we reported a convenient procedure for the synthesis of iodo-compounds using iodine and iodic acid in PEG-400. We have reported an eco-friendly procedure for the preparation of aromatic iodo compounds using iodine and iodic acid in green reaction media as polyethylene glycol (PEG-400).

Results: The iodination of some aromatic compounds such as benzaldehydes, acetophenones, phenols, amines, and heterocyclic compounds was carried out using iodine, iodic acid, and PEG-400. The synthesized substituted aromatic iodo compounds were confirmed based on the spectral characterization and mixed melting points.

Conclusion: The method comprises several advantages such as simple reaction procedure, easy isolation, quantitative yields, and purity of iodo products.

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Keywords: Iodination, aromatic compounds, iodine, iodic acid, PEG-400, cross-coupling reactions.

INTRODUCTION

Aromatic iodo compounds are important organic intermediates and are widely used in organic synthesis through Pd-catalysed cross-coupling reactions [1]. An iodinated aromatic compound shows a wide range of applications in medicine and biochemistry [2]. The broad interest of chemists towards iodination reaction is mainly due to the selective introduction of iodine atoms into the aromatic nucleus.

Various procedures have been reported for the iodination of aromatic compounds, which includes In(OTf)₃/I₂-ceric ammonium nitrate (CAN) [4], I₂-tetrabutylammoniumperoxydisulfate [5], NaI-cerium(IV) dodecyl sulfate (SDS) [6], NaI-amine-T [7], NH₄IO₃ [8], KI-oxone [9], H₂PV₂Mo₁₀O₄₀ [10], iodine-nitrogen dioxide [11], bis-iodosuccinimide [12], trichloroisocyanuric acid/I₂/wet [13], mercury(II)-oxide-iodine [14], iodine-chloride [15], bis(pyridine)iodonium(I), tetrafluoroborate [16], NIS-CF₃SO₂H, [17] iodine silver sulfate iodine-mercury salts [19], NaOCl-NaI [20]. These are documented literature procedures for the preparation of

iodoaromatic compounds, further keeping scope for researchers on environmental friendliness procedure. This is because most of the reported literature methods suffer from harsh reaction conditions, require high reaction temperature, high boiling solvents, use costly chemicals and catalysis, etc. Recently, under the green chemistry concepts, many environmentally benign procedures have been developed [21-23].

Most of the reported procedure comprises the toxic and expensive catalyst for iodination. In this respect, we reported a simple and convenient procedure for nuclear iodination using iodine and iodic acid combination. Iodine and iodic acid are solid in nature, and their combination leads to the easily workable and faster iodination procedure without the need for any toxic catalyst or mineral acids. On the other hand, PEG-400 is extensively used as green reaction media because of its high thermal stability, inexpensiveness, recovery, and non-toxic hydrophilic polymer properties. The high solubility of PEGs in water compared to other less polar solvents makes the PEGs easy to recover, and it is believed to produce high-performance reaction solvent in organic synthesis [24-32]. Therefore, the uses of inexpensive and environmentally benign organic solvents contribute to some significant outcomes for green chemistry. Herein, we introduced a simple, faster and eco-friendly procedure for the iodination of some series of different aromatic compounds using PEG-400 I₂/HIO₃ combination. Also, the present work

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An efficient, ultrasound induced ring closure of hydroxy chalcone in 2-ethoxy ethanol as an green reaction medium and study of antimicrobial potential.

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Abstract

An improved sonochemical condensation has been reported between chloro-substituted hydroxyl chalcones and hydrazine hydrate in 2-ethoxy ethanol as an efficient & alternative reaction medium in presence of sodium acetate and acetic acid to afford 2-pyrazolines. The pyrazolines were obtained in good to excellent yields (80-90%), and were characterized by conventional spectral data and evaluated for their antimicrobial potential. It is observed that the work-up is simple and the results obtained indicate that, unlike classical heating, ultrasound irradiation results in higher yields, shorter reaction times (1.5-2.5h) and milder reaction conditions. The investigation of antimicrobial potential revealed that all the synthesized compounds shows good to moderate growth inhibiting effect against microorganism tested.

Keywords: 2- pyrazolines, 2-ethoxy ethanol, chalcones, ultrasound, cyclocondensation, antimicrobial activity

Specification Table

Subject area	Organic Chemistry
Compounds	Chloro-substituted 2-pyrazoline derivatives
Data category	Synthesized and biological data
Dataacquisition format	¹ HNMR, IR, Mass spectra, Elemental analysis.
Data type	Experimental
Procedure	A series of Chloro-substituted 2-pyrazoline derivatives have been synthesized and characterized by spectral data and screened for their biological potential.
Data accessibility	Data is within the article.

1. Rationale




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Data Article

Synthesis of 1-(2-substitutedphenyl)-2,3-dihydro-1H-benzo[b][1,4]diazepin-4-yl)naphthalene-2-ol under different solvent conditions as a potent antimicrobial agent



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Solvent optimization

Antimicrobial activity

ABSTRACT

In the present investigation, 1-(2-substitutedphenyl)-2,3-dihydro-1H-benzo[b][1,4]diazepin-4-yl)naphthalene-2-ol (3a-3 h) were synthesized in optimization of solvents by reaction of 1-(2-(2-hydroxynaphthalen-1-yl)-3-substitutedphenyl)prop-2-en-1-one (1a-1 h) and benzene-1,2-diamine in catalytic amount of piperidine using 2-ethoxy ethanol as a solvent. The synthesized compounds were screened for their *in vitro* antimicrobial activity and we found that the compounds (3d and 3e) having electron withdrawing group and the compounds (3b, 3 g and 3 h) having electron releasing group at 4-position on phenyl ring showed good antibacterial and antifungal activity respectively. The compound 3 g shows same activity as that of standard drug Fluconazole against *A.niger*. Hence, it is found that the electron withdrawing and electron releasing group at para position on phenyl ring and 1:2 molar ratio of chalcones and benzene-1,2-diamine in 2-ethoxy ethanol as a solvent are the key factors to increase antimicrobial activity and yield of the synthesized compounds respectively.

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Specification table

Subject area	Organic Chemistry
Compounds	Substituted 1,5-benzodiazepines derivatives
Data category	Synthesized and biological data
Data acquisition format	¹ HNMR, IR, Mass spectra, Elemental analysis.
Data type	Experimental
Procedure	A series of substituted 1,5-benzodiazepines derivatives have been synthesized and characterized by spectral data and screened for their biological potential.
Data accessibility	Data is within the article

1. Rationale

Many Heterocyclic compounds are highly inspirable for mankind since humans are completely dependant on the drug to treat many diseases. 1,5-Benzodiazepines is a class of excellent organic molecules with a wide range of biological activities and therapeutic applications [1–3]. The use of 1,5-benzodiazepines for therapeutic purposes is not confined to the treatment

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HPTLC Profiling and Antimicrobial Studies of Some Commonly Used Indian Spices

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ABSTRACT

Indian medicinal system is one of the most believable and traditional system of medicine in the world where we find importance of spices and condiments in daily life. Spices have been in use as food additives since ancient times. They are used as flavoring agent and also as preservatives. Most of the spices are indigenous in origin with characteristic aroma and strong taste. These spices not only add flavor to dishes but also they have lots of medicinal properties. By considering their polyvalent significance in present investigation we have made an attempt to study antimicrobial potential and HPTLC profiling of *Curcuma longa*, *Cinnamomum verum*, *Cuminum cyminum*, *Piper nigrum*. Chromatographic analysis (HPTLC) showed presence of several phytochemical compounds with variable R_f values and concentration. The antibacterial activity showed significant growth inhibition against *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Pseudomonas aeruginosa*, *Streptococcus pyogenes*, and *Streptococcus pneumoniae*. The mixture of phytochemical compounds present in the extracts might be responsible for the antibacterial activity against these bacteria. The results obtained support the application of these spices in several traditional ethnomedicinal applications. Furthermore, HPTLC fingerprint developed may be useful in the correct identification of these spices and in detecting adulterations in preparation of commercial spice packets.

Key Words: HPTLC, Antimicrobial Activity, Spices.

1. INTRODUCTION

Forest resources have been a valuable source of natural products for a long period of time to maintain human health, especially with more intensive studies in the last decade for natural therapies (Gislen et al., 2000). Spices and herbs have been long used for thousands of centuries by many cultures to enhance the flavor and aroma of foods. Early cultures also recognized the value of using spices and herbs in preserving foods and for their medicinal value. Scientific experiments since the last 19th century have documented the antimicrobial properties of some spices, herbs and their components (Shelef, 1983; Zaika, 1988). The spices used in Indian cooking have been used since ages for adding flavor and also for house-hold treatment of infectious diseases. It is imperative to study their antimicrobial activity against the common

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Fermentation of Banana Must Using Mango Fruit Inoculums

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ABSTRACT

Wine was prepared from eight different varieties of banana (Khozikodu, Karpurchakra keli, Palaykondan, Alpan, Pisang celyan, Lamby, Karpuravalli and Ardhapuri). Alcohol% of the wines produced using different varieties of banana were found to be in the range of 4.34 to 7.89. Highest Alcohol % observed was 7.89% in wine produced using ardhapuri variety. The Ardhapuri variety in which more alcohol production was found was used as reference in this study. This study was performed to investigate the effect of mango fruit must inoculum on fermentation of banana wine. The banana must was prepared from pulp of ripe banana fruits of Ardhapuri variety. Pectinase enzyme and potassium metabisulphite (KMS) were added to the juice. Then it was chaptalized to 19°Brix. Diammonium phosphate (DAP) was added to this and pH adjusted to 3.5. The inoculum of banana juice and mango juice was used at a concentration of 10% for the fermentation banana must separately. After inoculation the fermentation was carried out at 20°C for about 22 days. Physicochemical parameters were then analyzed and concentration of volatile acids (VFA) was determined by using gas chromatography (GC). Banana wine produced using banana juice and mango juice inoculum had *Brix (6.1 and 6.5), alcohol (4.38 and 4.24%) and titratable acidity (0.93 and 0.83%) respectively. All nine volatile acids analyzed were detected in both wines. Significant effect was not observed on physicochemical parameters of banana wine produced by using different must inoculums.

Keywords: Banana must, banana wine, volatile acids, mango must

1. INTRODUCTION

Banana is one of the most important economic fruit crops. Because of high moisture content and textural characteristics, it is highly perishable in nature. By adopting proper post harvest management practices and processing into value added products, post harvest losses of banana can be reduced. Banana wine is a nutritious alcoholic beverage with low alcohol content. The cost of production of banana based alcoholic beverages is much cheaper than other fruit based beverages.

Banana fruit is having good amount of sugar which can be used as a substrate for production of fruit wine and the wines thus produced are generally named after the fruit used such as apple, grape, banana, pineapple, orange, coconut, mango and strawberry wine (Reddy et al., 2012; Shweta et al., 2016; and Ranjitha et al., 2015). Mango fruits are also one of the most common substrates for the production of fruit wine either by using

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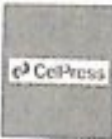
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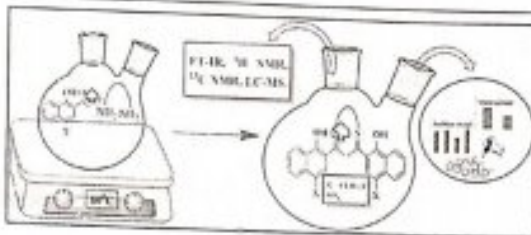


Research article

Synthesis, spectral studies, antioxidant and antibacterial evaluation of aromatic nitro and halogenated tetradentate Schiff bases

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GRAPHICAL ABSTRACT



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 Mass spectrometry
 Antimicrobial activity

ABSTRACT

Herein, we report the synthesis, characterization, and biological properties of eleven (3a–3k) novel Schiff bases. The spectral data of FT-IR, ¹H NMR, ¹³C NMR, and LC-MS are associated with these synthesized compounds. From the FT-IR analysis, we confirmed the azomethine (C=N) group and from ¹H NMR data, the phenolic -OH proton is appeared in range δ 13.02–14.09ppm due to hydrogen bonding. The LC-MS analysis agreed with molecular ion peaks of synthesized Schiff bases. To evaluate the antibacterial activity of newly synthesized compounds were screened against *E. coli*, *S. aureus*, *S. pneumoniae*, *P. aeruginosa*, and *K. pneumoniae*. The antioxidant activity was investigated by two methods 2,2-diphenyl-1-picrylhydrazyl (DPPH) and hydroxyl radical scavenging methods. The 1-(NO₂-Cl-Br-I) substituted compounds have shown good antibacterial activity against tested organisms. Also, these compounds were exhibited higher antioxidant activity by given methods.

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Synthesis, Characterization, Powder X-Ray Diffraction Analysis, ESR Study, Thermal Stability of Ni(II) and Fe(III) Schiff Base Ligand Complexes and Potency Study as Antibacterial and Antioxidant Agents

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ABSTRACT

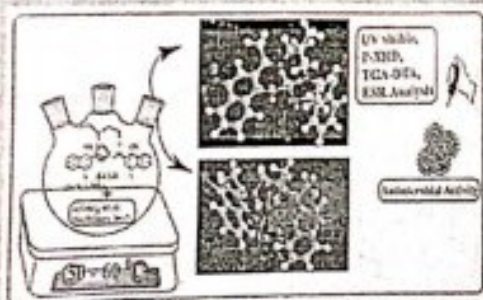
The salen type Ni(II) and Fe(III) complexes were successfully synthesized by using Schiff base ligand [1,2,2-Orientane 1,1-dialkyl(2-oxoethylidene)ethane-1-yl-1-stidene]-(naphtholen-1-yl) (L1) and its derivatives (L2) and (L3). Due to their chelating properties and ability to coordinate with a wide range of transition metal ions of different oxidation states, they are considered an important family of organic compounds. The structure of the metal complexes was elucidated by different spectral techniques: FT-IR, ¹H NMR, mass spectrometry, UV-visible, powder X-ray diffraction, DSC-TGA, and ESR. The powder X-ray diffraction data revealed that Ni(II) complexes are arranged in a triclinic system while Fe(III) complexes are in a monoclinic system with space group P1. TGA-DTA study suggests that the Ni(II) ions coordinate with the N₂O₂ Schiff base ligands with coordination number 4. Also, the Fe(III) ions coordinate with the N₂O₂ Schiff base ligands with coordination number 6. The Ni(II) complex exhibits the square planar geometry with unpaired electron lying in the d_{xy} orbital. The EPR spectra of Fe(III) complexes may suggest an octahedral structure around the Fe(III) ion. The antibacterial activity was tested against different pathogens and confirmed that the presence of the -Et and -NO₂ group with N₂O₂ donor Schiff base ligand are responsible for strongly inhibiting bacterial growth of metal complexes. The Ni(II) complexes showed higher potency antioxidant activity, indicating that the Ni(II) complexes exhibited more prominent antioxidant activity than the Fe(III) complexes.

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antibacterial activity;
spectral studies; metal
geometry optimization;
TGA-DTA analysis; ESR
studies



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EFFECT OF PLANTING METHODS ON ECONOMICS OF PADDY (*Oryza sativa*)

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Abstract: An experiment entitled, "Effects of planting methods on growth and yield of paddy (*Oryza sativa* L.)" was carried out during Kharif, 2020 at Agricultural Research Station Farm, Vadgaon Marol, Tal. Marol, Dist. Pune. The field experiment was laid out in Randomized Block Design (RBD) with three replications. There were eight treatments comprising of different sowing methods of rice viz., T₁-Sowing as direct seeded rice (DSR) at 22.5cm by bullock drawn seed drill, T₂-Sowing as direct seeded rice (DSR) at 30cm by bullock drawn seed drill, T₃-Sowing by dibbling method at 20 x 15 cm², T₄-Direct sowing of rice by tractor operated mechanical seed drill, T₅-Direct sowing of rice by 'Sagana Rice Technique' (SRT), T₆-Direct sowing of rice by 'Modified Direct Seeded Rice Technique' (MDSRT), T₇-University recommended method (Four Point Agro-Technology or Char Satri Method) and T₈-Farmers practice-Conventional transplanting method. The gross plot size was 3.60 m x 3.00 m and net plot size was different as per treatments.

The highest initial plant population per plot (247531) is observed in the treatment T₈-Farmer's Practice-Conventional transplanting method as no specific distance is used by the farmers for transplanting the seedlings which was significantly superior over rest of all the treatments. The highest final plant population per plot (245056) is observed in the treatment T₇-Farmer's Practice-Conventional transplanting method as no specific distance is used by the farmers for transplanting the seedlings. The sowing of paddy with the treatment T₆-Direct sowing of rice by 'Modified Direct Seeded Rice Technique' (MDSRT) recorded significantly highest gross monetary returns (₹160884 ha⁻¹), net monetary returns (₹109782 ha⁻¹) and B:C ratio (3.15) than rest of all the cultivation methods which was at par with the treatment T₇-University recommended method (Four Point Agro-technology) having gross monetary returns (₹140357 ha⁻¹), net monetary returns (₹86912 ha⁻¹) with B:C ratio (2.63). Based upon the above findings, it is concluded that T₆-Direct sowing of rice with 'Modified Direct Seeded Rice Technique' (MDSRT) or transplanting of rice with T₇-University recommended method (Four Point Agro-technology) are advisable for obtaining higher yield, net monetary returns and benefit: cost ratio in paddy.

Keywords: Planting Methods, Paddy, Economics, Direct Seeded Rice, SRT, Char Satri

Introduction: Rice (*Oryza sativa* L.) is one of the most ancient crops being cultivated in 117 countries, hence called as "Global grain". It is the staple cereal food grain of majority of India's over one billion population, contributes to nearly 44 per cent of total food grain production. Rice feeds more people over a longer period of time than any other crop. Rice has been documented in the history books as a source of food and for tradition as well since 2500 B.C. Beginning in China and the surrounding areas, its cultivation spread throughout Sri Lanka and India. Globally,

rice is cultivated in 154 million ha area with an annual production of around 426 million tonnes with average productivity of 2.76 t ha⁻¹ [1]. In India, it is being cultivated in 44.6 million hectares with a production of about 109.5 million tonnes. In Maharashtra, rice is the second important crop of the people, which is grown over an area of 14.99 lakh hectares with an annual rough rice production of 32.37 lakh tonnes. The average productivity of the state is 2.01 t/ha. Maharashtra ranks 13th place in rice production in the country. The average productivity


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STUDY OF PONDERAL INDEX OF FISH NOTOPTERUS NOTOPTERUS (PALLAS) FROM
GODAVARI RIVER, AT NANDED REGION, MAHARASHTRA, INDIA.

Zooology

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ABSTRACT

Study of Ponderal index of fresh water fish *Notopterus notopterus* (Pallas) from Godavari River at Nanded region, Maharashtra State were observed from July 2016 to June 2017. The obtained results showed *Notopterus notopterus* Condition factor follows a pattern of seasonal cycle related to feeding intensity and spawning activity. Low feeding was observed from July to September and high feeding intensity was noted during October to June.

KEYWORDS

Ponderal index, *Notopterus notopterus*

INTRODUCTION

Ponderal index condition factor or coefficient of condition forms an important biological measures usually used in fish biology research to express the relative condition of a fish and provide additional information on various aspects such as maturity, spawning, feeding intensity etc. related to the well being of a fish.

The coefficient of condition is generally denoted by 'K' is an important biological measure. The ponderal index is also adopted to study the condition of the fish during different seasons and different stages of growth.

The changes in condition have usually been analysed by means of condition factor or coefficient of condition 'Ponderal index' etc. Thompson (1942), Hile (1936). This is calculated as a ratio between the observed weight and that expected from the observed length. The basis of the expected weight is that for an ideal fish in whose length weight relationship formula $(1) W = aL^n$, $n = 3$ and thus obeys the cub law. Various types of condition factor have been used, but in one of the original ones the condition was measured by the constant c , equivalent to a in $(1) W = cL^3$, therefore $c = \frac{W}{L^3}$. As however c when calculated is often awkward decimal number the average value of c found by formula had a new condition factor 'K' found that would vary about unit $K = \frac{W}{L^3}$.

The value of c depends partly on the units used for weighing and measuring the fish. In instances where the original value of c chosen was found to have only limited application, and K was found to average about some value approximating to, but not exactly 1, c has been further altered to a convenient round number and often changed to its reciprocal.

$$K = \frac{W}{L^3}$$

For example = $\frac{1200g}{1^3}$ (Hile, 1936)

Where L is in centimeters and W in grams.

According to Heacht (1916), condition factor studies correspond to the cyclic changes that the species undergoes in the nutrition and reproduction. Several workers like Menon (1950), Pilay (1954), Sarojini (1957) and others have correlated the condition factor with the attainment of maturity and feeding intensity of the lake and berrings. In *Sardinella pilchardus* he observed that the condition was low before and high after spawning due to sexual cycle and feeding activity respectively.

Kesteven (1947), pointed out that a true ponderal index should be obtained by comparing volume of fish with its weight in which form it will be a measure of relative density or weight per-unit volume, the later being a function of the fish volume which is a cubic function of its linear dimensions.

LeCren (1951) remarks "The ponderal index forms an important part of fishery research and has often been used to provide additional information about spawning, feeding and other aspects related to the

well being of a fish.

Kagwade (1968), states that the weight of the fish is aid to vary with the cube of its length. Any deviation from this relationship has been attributed to physiological changes in the fish. Changes in the condition factor may be due to the season and size.

Several other workers have been made investigations on the condition factor of different species and correlated the variation in 'K' values with various factor in life of fish. Hickling (1930, 1940), Hille (1936), Thompson (1943), Menon (1950), LeCren (1951), have correlated the ponderal index with spawning cycle and feeding intensity in *johnius dussumieri*.

Review of literature shows that there is no information regarding the condition factor of *Notopterus notopterus* as it is recently investigated by Palls. Therefore the present investigation was undertaken with a view to study the condition factor of this fish, i.e. *Notopterus notopterus*.

MATERIAL AND METHODS

In the present study 190 males and 36 females ranging between 13 cm to 30 cm in total length were analysed by adopting the formula

$$K = \frac{W}{L^3} \times 100$$

Proposed by LeCren (1951), where "W" is the weight and "L" is the total length of the fish. After calculating the 'K' values individually the data were analysed separately for males and females in 3cm class intervals, with a view to study the fluctuations in 'K' values in relation to size at first maturity and growth of the fish and the spawning seasons.

RESULTS AND DISCUSSION

The mean K values of different length groups and represented in the table 1 and fluctuations during different months of the year in the table 2.

It is seen from the tables that 'K' values for males were higher than those of females which may indicate that the better condition of male than that the female (Parulekar and Bal, 1970) in *Breogranosus maclellendi*, Mehta (1974) in *Ophiocephalus uagchus*.

The lowest 'K' values for male 0.6833 and for female 0.7377 recorded at 28 cm -30 cm size group in male and 19 cm - 21 cm size group in female. From the table showing 'K' values during different months, it can be seen that 'K' values for the Females were slightly lower than those for male. Table 2. Shows that the 'K' values fluctuated between 0.7370 and 0.2630 in male in the month of July 2016 and February 2017 respectively. In females the 'K' values fluctuated, 0.6935 in October 2016 and 0.7205 in April 2017.

From the table showing the 'K' values for male and female it can be seen that the values were highest during February in both the sexes decline gradually, thereafter, upto September. In October 'K' values in

RESEARCH ARTICLE

Variations of protein contents in the muscle of fish *Notopterus notopterus* (pallas) from Godavari river at Nanded region, Maharashtra, India.

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ABSTRACT

The seasonal variation in protein content of fresh water fish *Notopterus notopterus* from Godavari River at Nanded region, Maharashtra state were observed from January 2016 to December 2016. The obtained results showed that protein content was high in the month of July (16.9± 1.20), the lowest was high in the month of January 16.16 and December 15.63, then there was a slight increase in the protein content in the month of February, March, April, May and June which ranges 16.17, 16.70, 18.42, 18.62, 19.30 tissue respectively. Variation of protein content during different seasons of the year helps. Nutritionists & researchers who are striving to improve the nutritive value, processing & marketing of endangered fish species & in fishing industry.

Keywords : Protein, monthly variation, Seasonal variation, *Notopterus notopterus*.

INTRODUCTION

Fish are known to be a very healthy food items. They are an excellent protein source & also contain various minerals & Vitamins necessary for good health. Scientist reported that societies with high fish intake have considerably lower rates of acute myocardial infarctions & other ischemic heart diseases. The present availability of protein is much below the minimum daily requirements and the livestock sector alone will not be able to meet the protein requirement of ever increasing human population. Fish is an excellent & relatively cheaper protein source of high biological value. Fish protein contains all essential amino acids in the required proportion and hence have a high nutritional value, which contribute to their high biological value. Cereal protein is an excellent source of these amino acids.



Relationship between Water, Lipid and Protein in the Muscle, Liver and Gonad in a Freshwater Fish, *Notopterus notopterus*(Pallas)

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Abstract: Variation in water, lipid, protein in Muscle, Liver, Testis, Ovary of Fresh water fish *Notopterus notopterus* from Godavari River at Nanded Region Maharashtra State. Were observed from January 2017 to December 2017. 100 fishes with in 60 male and 40 female. It is observed that *Notopterus notopterus* contains 21% protein which high protein compared to hen's egg.

Keywords: Water, lipid Protein in muscle Liver, and Gonad, *Notopterus notopterus*.

1. INTRODUCTION

Love (1970) stated that an increase in the proportion of either water, lipid or protein leads to the decrease of the other, so that the sum remains approximately constant. Rao (1967) and Jafri & Khawaja (1968) have shown an inverse relationship between water and fat in freshwater fishes. The fluctuation in the major biochemical constituents are influenced by breeding and feeding cycles (Lovern & Wood, 1938; Rao 1967). Relationship of water lipid and protein in *Notopterus notopterus* is reported in this communication.

2. MATERIAL AND METHOD

Notopterus notopterus were collected from the Vellayani Lake, Trivandrum. The specimens were sexed and grouped into classes based on the stages of maturity. From each specimen the muscle, liver and gonad were dissected out and dried in an oven at 105°C. The difference in weight between wet and dehydrated tissue gave the water content. The lipids were extracted by adding ethanol ether mixture (3:1 v/v) two times and heated to 60°C. The supernatant removed by centrifugation. The above process was repeated with another solvent mixture of methanol and chloroform (1:1 v/v) for the same sample. The lipids were recovered from solvents by distillation (Gradwohl, 1963). Microkjeldahl method (Wong, 1923) as modified by Alexander (1956) was used for determining the nitrogen content.

In the muscle, liver (female) and gonad of *Notopterus notopterus* the variation of lipid and protein showed an inverse relationship with the variation in water content. But the water content of the liver of male *Notopterus notopterus* showed a direct relationship with lipid and protein content (Table 1).

Table 1: Percentage Composition of Water, Lipid, and Protein in the Muscle, Liver and Gonad of male and female *Notopterus notopterus*

Sex	Tissue	Constituent	Immature	Maturing	Ripening	Ripe	Spent
(Percentage by wet weight)							
Male	Muscle	Water	80.00	77.00	76.00	82.10	82.0
"	"	Lipid	2.6	3.16	3.42	2.60	2.50
"	"	Protein	12.70	14.2	15.18	10.50	9.10
Female	"	Water	82.20	80.4	78.20	81.0	81.0
"	"	Lipid	2.5	3.36	3.50	2.84	1.2



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FOOD AND FEEDING HABITS OF *PUNTIUS SARANA* (HAMILTON) FROM GODAVARI RIVER, NANDED, MAHARASHTRA STATE

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Abstract: The food composition of *Puntius sarana* was studied for a period of April 2015 to March 2016. The fish feed on both types of foods plant as well as animal origin. The food and feeding habit of *Puntius sarana* has showed that it is omnivorous. Total food items of *Puntius sarana* divided into four groups phytoplanktons (55.45%) followed by zooplankton (26.1), macroinvertebrates (12.21%) and miscellaneous items (6.56%). Phytoplankton was the first preference of *Puntius sarana* and it is observed for 55.45% of the total items.

Keywords: Food and feeding habits, omnivorous, Gadavari river.

1. INTRODUCTION

The study of food and feeding habits of fishes is considered very important in fishery biology. Food is the main source of energy and plays an important role in the life history of fishes. The basic function of life such as growth, development and reproduction take place at the expense of energy, which enters the organisms in the form of food (Nikolsky, 1963). The food habits of some fishes living in different parts of a regime may vary due to differences in physico-chemical and biological characteristics of their feeding niches. A thorough knowledge of food and feeding habit is also necessary for understanding biochemical composition of fish and for successful fish farming or aquaculture. Recent work on food and feeding habits of fish has done by several workers viz., Begum et al. (2008), Ayoade et al. (2008), Arthi et al. (2012), Gupta and Banerjee (2013), Allison and Sikoki (2013), Dutta et al. (2013), Akombo et al. (2014) and Singh et al. (2014). In view of above information, study of food and feeding habits of *Puntius sarana* from Godavari river, Nanded region, Maharashtra has been conducted and is presented in this paper.

2. MATERIALS AND METHODS

Collection of the fish samples:

In order to study food and feeding habit, a total of 600 fish specimens (11.0 cm to 26.6 cm length) were collected on monthly basis from April 2015 to March 2016 from Godavari River at Nanded. The field collections were done with the help of local fishermen. Each fish was dissected, after recording length, weight and sex. Gut content was preserved in 5% formaldehyde. Each gut content was considered as unit, the gut contents were identified and number of each taxon were recorded. The percent composition of each food items was calculated following Hynes (1950) and Moitra S.K. (1973).

The nature of gut contents revealed that *Puntius sarana* is omnivorous in habit. Among the food, phytoplanktons, dominated throughout the year in the form of major food item by fishes. Zooplanktons, Macro-invertebrates and some Miscellaneous items were found in the gut of fishes. The month wise variations in the percentage composition of different food items is given in Table 1.



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VARIATION OF PROTEIN CONTENTS IN THE MUSCLE OF FISH *PUNTIVUS SARANA* (HAMILTON) FROM GODAVARI RIVER AT NANDED REGION, MAHARASHTRA STATE

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Abstract: The seasonal variations in protein content of fresh water fish *Puntius sarana* from Godavari River at Nanded region, Maharashtra State were observed from April 2015 to March 2016. The obtained results showed that protein content was high in the month of July (16.9 ± 1.20) the lowest was in the January (13.9 ± 1.50) and December (14.2 ± 1.20). Then there was a slight increase in the protein content in the month of February, March, April, May and June which ranges 14.3 ± 1.70 , 14.7 ± 1.50 , 15.1 ± 1.30 , 16.2 ± 1.40 , 16.3 ± 1.60 g/g tissue respectively. Variation of protein content during different seasons of the year helps nutritionists and researchers who are striving to improve the nutritive value, processing and marketing of endangered fish species and in fishing industry.

Keywords: Protein, Monthly variations, seasonal variations, *Puntius sarana*.

1. INTRODUCTION

Fish are known to be a very healthy food items. They are an excellent source and also contain various minerals and vitamins necessary for good health. Scientists reported that societies with high fish intake have considerably lower chances of acute myocardial infarctions, atherosclerosis and other ischemic heart diseases. The present availability of protein is much below the minimum daily requirements and the livestock sector alone will not be able to meet the protein requirements of ever increasing human population. Fish is an excellent and relatively cheaper source of high biological value. Fish protein contains all essential amino acids in the required proportion and hence has a high nutritional value, which contribute to their high biological value. Cereal proteins are usually low in lysine and or the sulphur containing amine acids like methionine and cysteine, where as fish protein is an excellent source of these amino acids. Fish also contains threonine, tryptophan, isoleucine, leucine, phenylalanine, and valine amino acids. In diets based mainly on cereals, a supplement of fish can, therefore, raise the biological value significantly. Fish is also rich in the non-protein amino acid taurine, which has a unique role in neurotransmission.

Although several studies deal with the proximate composition of biochemical components of many commercially important fishes, but no works has been carried out on *Puntius sarana* particularly from Nanded region of Maharashtra State. Therefore, the present study was undertaken to show seasonal and monthly variations in the amount of total protein content in muscle of *Puntius sarana*, to determine the nutritional value and variations during the fishing season which is very important in recent years.



FRESH WATER FISH FAUNA OF KARADKHED DAM, DEGLUR, NANDED, MAHARASHTRA, INDIA

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Abstract: The Karadkhed Dam is Perennial water body of Deglur City, water is used for water supply and irrigation purpose. Fishes were collected from Karadkhed Dam during 2016-2017 by different types of nets. 18 species belonging to 09 Genus, 04 Order, and 05 Family were recorded from this region.

Keywords: Freshwater fish fauna, fishes, Karadkhed dam.

1. INTRODUCTION

Fishes are from one of the most important groups of vertebrates influencing his life in various ways. Millions of human being are suffer from hunger and malnutrition and fish from a rich source of food and nutrition and provide a meal to tide over the nutrition difficulties of man in addition to serving as an important item food. The fishes are also provided several products and by products including fish oil used for medicinal and industrial in the life of human being.

Fishes of the fresh or inland water bodies of the Indian sub-continents have been subject of study since last century; Hamilton Buchanan (1822);day (1878); Tiwari; Jayram (1981);Tiwari and Jhingran (1991), Ghate and Wagh (1991);(1994;1995) Roa et.al.(1999); Datta et.al.,2000 a,b,c Datta et.al.(2003); Paik et.al.(2003).

Reservoirs fishery in india is also important from social economic point of view assist has the potential providing point of view assist has the potential providing employment to about millions people. According to Sughean (1995); total area under the reservoirs in india 3.1 million hectares; there are includes 19000 small reservoirs with a total water surface area 14855.57 hectares and about 180 medium 56 large reservoirs of 527641 and 1140268 hectares reflectively. The Maharashtra is endowed with an area 179430 hectares under reservoirs and staff produces more than 516 tones of fishes of these area; the state fisheries corporation was operating in 6,272 hectares of revelators and marketing the catches.

2. FISHES IN KARADKHED DAM

Phylum	Chordata
Sub-phylum	Gnathostomata
Super-class	Pisces
Class	Teleostomii
Sub-class	Actinopterygii
Order	Cyprinidae
Family	Cyprinidae
Genus	Catla
Species	Catla
Genus	Labeo
Species	ophita,bata and calbasu
Genus	Gambusia

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STUDY OF FISH MARKET IN NANDED CITY, MAHARASHTRA (INDIA)

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Abstract: The study was carried out to find the status of wholesale, Local fish market in Nanded City. Large number of Intermediaries are involved in various activities of fish marketing in Nanded city. We collected Seven Month data December 2017 to July 2018 about fix prize, wholesale rate, market rate.

Keywords: Fresh water fishes, fish market, Nanded.

1. INTRODUCTION

Fishes are cold blooded, Aquatic Animal and good sources of protein, vitamins, mineral and oil, Fish market is a place where the fishes and fish products of commercially Importances are marketed. Production and Consumption marketed. Production and consumption through sale is known as fish marketing by Shammi and Bhatnagar, (2002), Biswas (2006) reported that demand and consumption patterns of Fish are determined by feeding habits of the locality. Bankole (2012) Explain that marketing and fish distribution is done through various channels.

2. MATERIALS AND METHODS

The data are collected through survey of fish market with the helps of observing questionnaire and interview technique. In Nanded city there are two type of market regular and weekly fish market, regular fish market located at Erwara area of Nanded, where as weekly fish market located such as Wednesday fish market (Taroda naka), Friday fish market (Gokul Nagar) and Sunday fish market (old Mondha) fisher man fishes captured from River Godavari, Vishnupuri Dam, Barul Dam (Near Kandhar) Shikarghat Pond and 5 to 10 km away ponds from Nanded city.

Study was undertaken from December 2017 to July 2018. The data was collected from local fish market by oral interview methods.

3. RESULT AND DISCUSSION

Fish like Catla, Labeo, Channa, Common Carp, Tilapia are sold in large quantity, because it have the good demand. Clarius gariepinus having good demand because it contains high amount of amino acid which helps in the synthesis of RBCs. From January to June prise of fishes is high due to Summer session. Low prise fishes are also sold in the market.

Fish Pangasius pangasius and clarius gariepinus brought from Andhra Pradesh.

Table No.1: Show the fishes commonly available in local fish market Taroda Naka Market, Friday market, Erwara Market.

Sr. No.	Fishes Name		Area Name	Year December 2017 to July 2018 & Rate
	Scientific Name	Local Name		
1	Catla Catla	Catla	Vishnupuri Dam, Basar	250 Rs. to 340 Rs.
2	Labeo Rohita	RoHu	Nanded	200 Rs. To 220 Rs
3	Cirrhinus mrigala	Mrigla	Nanded	180 Rs. To 210 Rs.
4	Cteropharyngodoni-della.	Grass Carp	Nanded	210 Rs. To 225 Rs.
5	Wallagoatta	Atula	Nanded	190 Rs. To 210 Rs.



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Studies On Moisture And Fat Content In Different Organs Of *Puntius sarana* From Godavari River At Nanded Region (M.S.)

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Abstract: *Puntius sarana* is a teleost fish commonly known as 'Potis' in Nanded region. The healthy fish specimens were purchased from the weekly market at Nanded, between April 2015 to March 2016. From market they were carried in ice box and immediately transported to the laboratory. The specimens after having brought to the laboratory were cut open to determine the sex and biochemical analysis i.e. fat and moisture content were carried out. The percentage of moisture in the muscles of *Puntius sarana* was found to fluctuate between 53.60% to 60.25%. The percentage of moisture in liver was found to fluctuate between 53.10% to 57.94%. In ovaries the percentage of moisture content fluctuates between 53.00% to 57.47%. The fat content in muscle was found to fluctuate between 1.60% to 2.39%. The fat content in liver was fluctuate between 3.07% to 4.10%. The fluctuation in the percentage of fat content in ovaries was varied from 1.70% to 3.77%. The result obtained in this study has provided detailed knowledge of moisture and fat content of the *Puntius sarana* fish.

Keywords: *Puntius sarana*, Godavari River.

I. INTRODUCTION

Fish is known as an important source of food and also provide certain other useful products and hence has a great significance in the life of mankind. Balanced diet is very essential for satisfactory growth and health of human beings. In the present study moisture and fat contents were estimated monthly in muscles, liver in both sexes and gonads in females only. Monthly estimation of body components were carried out from April 2015 to March 2016. Durairaj (1962), found increase in the water percentage in muscles and ovaries of *Cirrhina reba* during spent condition. According to Jafri and Khawja (1968) the moisture content in the spawning season is low in *Ophiocephalus pumctatus*. Jafri (1968), correlated the rise and fall in the fat contents of muscles with the feeding activity and the maturation cycle in *Mystus seenghala*. Jafri and Khawja (1968) observed that the saturation of gonads was accompanied by rise in its fat content.

2. MATERIALS AND METHODS

Sampling site: *Puntius sarana* were purchased from weekly market at Nanded, Maharashtra State (India) from the fisherman. The fish samples were transported in an insulated iced container to the Fishery laboratory of N.E.S. Science College, Nanded (M.S.)

Moisture Determination: Each fresh tissue sample was weighed accurately and dried in an oven at 80°C for 24 hours and then weighed again after cooling at room temperature in desiccators. The difference in two weights viz, wet weight and dry weight of the sample was considered as moisture content.

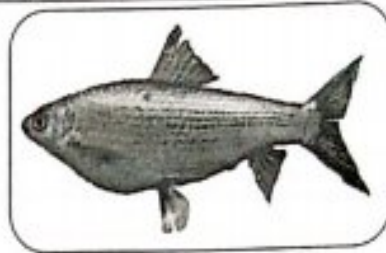
Fat Determination: The fat was estimated from the known amount of dry sample with the solvent ether in Soxhlet apparatus till no more fat was extracted. The ether was then evaporated and the resultant fat was weighed accurately.





VARIATIONS OF PROTEIN CONTENTS IN THE MUSCLE OF FISH *CIRRHINUS REBA* (Hamilton, 1822) FROM GODAVARI RIVER AT NANDED REGION, MAHARASHTRA, INDIA.

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ABSTRACT :

The seasonal variation in protein content of fresh water fish *Cirrhinus reba* from Godavari River at Nanded region, Maharashtra state were observed from January 2018 to December 2018. The obtained results showed that protein content was high in the month of July (16.9+ 1.20), the lowest was high in the month of January 16.16 and December 15.63, then there was a slight increase in the protein content in the month of February, March, April, May and June which ranges 16.17, 16.70, 18.42, 18.62, 19.30 tissue respectively. Variation of protein content during different seasons of the year helps. Nutritionists & researchers who are striving to improve the nutritive value, processing & marketing of endangered fish species & in fishing industry.

KEYWORDS : Protein, monthly variation, Seasonal / variation, *Cirrhinus reba*.

INTRODUCTION

Fish are known to be a very healthy food items. They are an excellent protein source & also contain various minerals & Vitamins necessary for good health. Scientist reported that societies with high fish intake have considerably lower rates of acute myocardial infarctions & other ischemic heart diseases. The present availability of protein is much below the minimum daily requirements and the live stock sector alone will not be able to meet the protein requirement of ever increasing human population. Fish is an excellent & relatively cheaper protein source of high biological value. Fish protein contain all essential amino acids in the required proportion & hence have a high nutritional value, which contribute to their high biological value. Cereal protein is an excellent source of these amino acids. Fish also contain lysine, threonine, tryptophan, isoleucine, leucine, phenylalanine & valine amino acids. In diets based mainly on cereals, a supplement of fish can. Therefore raise the biological value significantly. Fish is also rich in the non protein amino acid taurine which has unique role in neurotransmission.

Although several studies deal with proximate composition of biochemical component of many commercially important fishes, but no work has been carried out on *Cirrhinus reba* particularly from Nanded Region of Maharashtra state. Therefore the present study was undertaken to show seasonal & monthly variation in the amount of total protein content in muscle of *Cirrhinus reba* determine the nutritional value & variations during the fishing season which is very important in recent years.

MATERIALS AND METHODS :-

Samples of *Cirrhinus reba* were collected from fish market at monthly intervals during the period of January 2018 to December 2018. They were immediately transported to the laboratory of




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Studies On Moisture And Fat Content In Different Organs Of *Puntius sarana* From Godavari River At Nanded Region (M.S.)

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Abstract: *Puntius sarana* is a teleost fish commonly known as 'Potis' in Nanded region. The healthy fish specimens were purchased from the weekly market at Nanded, between April 2015 to March 2016. From market they were carried in iced box and immediately transported to the laboratory. The specimens after having brought to the laboratory were cut open to determine the sex and biochemical analysis i.e. fat and moisture content were carried out. The percentage of moisture in the muscles of *Puntius sarana* was found to fluctuate between 53.60% to 60.25%. The percentage of moisture in liver was found to fluctuate between 53.10% to 57.94%. In ovaries the percentage of moisture content fluctuates between 53.00% to 57.47%. The fat content in muscle was found to fluctuate between 1.60% to 2.39%. The fat content in liver was fluctuate between 3.07% to 4.10%. The fluctuation in the percentage of fat content in ovaries was varied from 1.70% to 3.77%. The result obtained in this study has provided detailed knowledge of moisture and fat content of the *Puntius sarana* fish.

Keywords: *Puntius sarana*, Godavari River.

1. INTRODUCTION

Fish is known as an important source of food and also provide certain other useful products and hence has a great significance in the life of mankind. Balanced diet is very essential for satisfactory growth and health of human beings. In the present study moisture and fat contents were estimated monthly in muscles, liver in both sexes and gonads in females only. Monthly estimation of body components were carried out from April 2015 to March 2016. Durairaj (1962), found increase in the water percentage in muscles and ovaries of *Cirrhina reba* during spent condition. According to Jafri and Khawja (1968) the moisture content in the spawning season is low in *Ophiocephalus punctatus*. Jafri (1968), correlated the rise and fall in the fat contents of muscles with the feeding activity and the maturation cycle in *Mystus seenghala*. Jafri and Khawja (1968) observed that the saturation of gonads was accompanied by rise in its fat content.

2. MATERIALS AND METHODS

Sampling site: *Puntius sarana* were purchased from weekly market at Nanded, Maharashtra State (India) from the fisherman. The fish samples were transported in an insulated iced container to the Fishery laboratory of N.E.S. Science College, Nanded (M.S.)

Moisture Determination: Each fresh tissue sample was weighed accurately and dried in an oven at 80°C for 24 hours and then weighed again after cooling at room temperature in desiccators. The difference in two weights viz, wet weight and dry weight of the sample was considered as moisture content.

Fat Determination: The fat was estimated from the known amount of dry sample with the solvent ether in Soxhlet apparatus till no more fat was extracted. The ether was then evaporated and the resultant fat was weighed accurately.




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Study On Ponderal Index Of Fish *Puntius sarana*(Hamilton) From Godavari River, At Nanded, Maharashtra State, India

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Abstract: Study of Ponderal index of freshwater fish *Puntius sarana*(Hamilton), from Godavari River, at Nanded, Maharashtra State were observed from April 2015 to March 2016. The obtained results indicate that population of *Puntius sarana* is better in condition throughout the year even in spawning season. LeCren (1951) remarks "The ponderal index forms an important part of fishery research and has often been issued to provide additional information about spawning, feeding and other aspects related to the well being of a fish. Several other workers have been made investigations on the condition factor of different species and correlated the variation in 'K' values with various factor in life of fish. Heckling (1930, 1940), Hile (1936), Thompson (1943), Menon (1950), LeCren (1951) have correlated the ponderal index with spawning cycle and feeding intensity in *Johnius dussumieri*. Review of literature shows there is no information regarding the ponderal index of *Puntius sarana*. Therefore the present investigation was undertaken with a view to study the ponderal index of this fish.

Keywords: fish *Puntius sarana*(Hamilton), Godavari River, spawning season, ponderal index.

1. INTRODUCTION

Ponderal index forms an important biological measures usually used in fish biology research to express the relative condition of a fish and provide additional feeding etc related to the well being of a fish. It is denoted by 'K'.

2. MATERIAL AND METHODS

In the present study 220 males and 380 females ranging between 11 cm to 26.6 cm in total length were analyzed by adopting formula $K = W/L^3 \times 100$ proposed by LeCren (1951), where 'W' is the weight and 'L' is the total length of the fish. After calculating the 'K' values individually the data were analyzed separately for males and females in 3 cm class intervals with a view to study the fluctuations in 'K' values in relation to size at first maturity and growth of the fish and the spawning season.

3. RESULTS AND DISCUSSION

The mean 'K' values of different length groups are represented in the table no.1 and fluctuations during different months of the year in the table no. 2. From table no. 1 the lowest 'K' values for male 0.9810 and for female 1.0044 recorded at 25.6 cm for 28.5 cm size group in male and 25.6 cm to 28.5 cm group in female. Fluctuation in 'K' values in each 3 cm size group shows in Fig 1. Table no. 2 which shows 'K' values during different months, it can be seen that 'K' values for the males were slightly lower than those for female. Table no. 2 shows that the 'K' values fluctuated between 0.9962 and 1.3422 in males in the month of March 2016 and September respectively. In females the 'K' values fluctuated between 0.8789 in March 2016 and 1.9411 in May 2015. From table no. 2 it can be seen that 'K' values for male were highest during September and decline gradually thereafter up to March. Months fluctuation in 'K' values show in Fig. 2. A fish is to be in better



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Study of Morphometric Characters of *Puntius sarana* (Hamilton) from Godavari River at Nanded region (Maharashtra State)

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DOI: <https://doi.org/10.5281/zenodo.6655985>

Published Date: 17-June-2022

Abstract: The present study was carried out to analyze morphometric measurement of *Puntius sarana* fish during April 2015 to March 2016. Fish specimens were collected from local fisherman at Nanded and seven morphometric characters were studied. The total length and weight of *Puntius sarana* were ranged from 11.00 cm to 26.6 cm and 13.6 gm to 231.41 gm respectively. The standard length and height of fish were ranged from 8.5 cm to 21.4 cm and 2.3 cm to 8.2 cm respectively. The head length and intra orbital space were ranged from 2.1cm to 6.0 cm and 0.9 cm to 1.0 cm respectively. Snout to dorsal fin length was ranged from 6.8 cm to 16.6 cm.

Keywords: *Puntius sarana*, Morphometric, Godavari river.

1. INTRODUCTION

Godavari River is India's second largest River after the Ganga River. It's source is in Trimbakeshawar Maharashtra State. *Puntius sarana* (Hamilton, 1822) is a tropical fish belonging to the *Puntius* genus of minnow family. It can be used as both food and ornamental fish. It is omnivorous and widely distributed through the Indian sub continent including India, Bangladesh, Afghanistan, Pakistan, Nepal, Bhutan, Sri-lanka, and Thailand. Morphometric study of fish species is an important tool for exact identification of the species with the help of measuring the length, weight and other parameters (Cavalcanti *et al.* 1999)

2. MATERIAL AND METHOD

In order to study the morphometric measurements total 600 fish specimens were collected on monthly basis (50) from April 2015 to March 2016 from Godavari River at Nanded. The field collection were done with the help of local fisherman. The collected fish samples were preserved in 10% formalin and stored into specimen jar to study the morphometric characters. The selected morphometric measurements were measured with the help of electronic balance (MP-3000 chyo Japan) engineering divider and graduated scale in cm etc. All measurements were taken in the laboratory as Day (1875-78), Talwar and Jhingran (1991) and Jayaram(2010). The weight of all fish samples measured in gram (gm) and other morphometric parameters measure in centimeter (cm). The total length ranging between 11.00 cm to 26.6 cm. On the basis of total length, the fishes were grouped into 3 class intervals.

Observations

(Tables 1 to 6 and Fig. 1 to 5)

In order to know the relationship between any two morphometric measurement, the statistical method proposed by Snedecor (1961) were used in the present study to correlate the variables viz (1) Standard length (2) Head length (3) Diameter of eye (4) Inter orbital space (5) The dorsal length (6) Height of body with the total length, the linear regression was used.



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Studies on Relationship between Length and Weight of *Puntius sarana* (Hamilton) From Godavari River at Nanded Region (M.S.) – India

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DOI: <https://doi.org/10.5281/zenodo.7762936>

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Abstract: Studies on the length weight relationship of fishes have been recognized as an important aspect in fishery biology study. Data on the length and weight of the fish commonly been analyzed to yield biological information. The analysis of length-weight data has usually been directed towards two rather objects. First towards describing mathematically the relation between length and weight primarily so that one may be converted into the other. Secondly to measure the variation from the expected weight for length to measure the variation from the expected weight for the length of an individual fish or relevant group of individual as indications of fatness, well being, gonad development etc.

Keywords: *Puntius sarana*, Fish, Godavari River.

1. INTRODUCTION

Puntius sarana is a freshwater fish commonly known as "Potis" or "Punkti" found in Godavari River at Nanded region (Maharashtra State) India. The study on length weight relationship is the most important aspect in biological studies of fish. Such studies were carried out in different fishes previously by Brown, M.E.(1957), Dan, S. and Mojumdar, P.(1978), Dhulkhed, M.H.(1963), Jhingran, V.G.(1959), Lacrene, E.D. (1951), Mojumdar, P. (1971), Mohan, M.V. and Sankaran, I.M. (1988), Narsimham, K.A. (1970), Pathak, S.G. (1975), Rangrajan, K. (1973), Samuel Olu (1990), Sekharan, K.V. (1968), Sivakami, S. (1987), Victor, A.C.(1978) and many other workers have contributed to length-weight relationship studies in fishes. During present studies investigation were conducted to determine length and weight relationship in the fish *Puntius sarana*.

2. MATERIAL AND METHODS

The present study was carried out for the period of one year i.e. from April 2015 to March 2016 to determine the length-weight relationship in males and females of *Puntius sarana*. For this purpose 600 specimens were taken. Out of 600 specimens 220 were male and 380 were females. Total length of fish was measured in cm and weight in grams individually by removing surface moisture with blotting paper. The mean length and mean weight was calculated by arranging them into 06 groups of 03 cm class intervals. The length-weight relationship was determined by using general parabolic form of equation given by Lacrene. $W = aL^b$ Where W= Average-weight of the fish and L= Average length of fish and a and b are constant to be determined.



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A Study of Sex Ratio of Fresh Water Fish *Puntius sarana* From Godavari River at Nanded Region, Maharashtra State (India)

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DOI: <https://doi.org/10.5281/zenodo.7762510>

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Abstract: The study estimated the sex ratio of *Puntius sarana* from the Godavari River at Nanded region, Maharashtra State. Fish were collected on monthly basis by local fisherman using traditional fishing gear i.e. cast net. The sex population of *Puntius sarana* found a significant sex ratio male 0.36 and female 0.63 and the percentage of male and female are 33.43% and 66.75%. The ratio was seen fluctuate during year. In general female seem to dominant in the population.

Keywords: Sex ratio, Godavari river, *Puntius sarana*.

1. INTRODUCTION

A prior knowledge of sex population estimation in fishes is essential for the management practices of fishery sciences. It is important to ensuring a proportional fishing of two sexes. Sex population estimation is defined the abundance of any sex at a particular time or the population is in natural condition, abnormal condition. It is generally found that in a healthy population, the sex ratio should be 1:1. There are other several factors like temperature, water velocity, vulnerability of females to their predators, migratory phase and other ecological hazards, which possibly change the sex composition in stream and rivers. (Jamoolabevi and Ramachandran 2005). For commercial utilization of any fish species, it is highly essential to have a prior knowledge it spawning behavior, which includes months, frequency, sex ratio etc. (Verma, 2019 a). Many ichthyologists have worked on the fishes breeding biology, sex ratio and other aspects of different fishes biology. (Sobhana and Nair, 1976; Dobriyal et al., 2004, Kumar et al., 2006; Shende and Mazi, 2009 and Bahuguna et al., 2009, Krishna et al., 2012, Verma 2013 b). The present study is continuation with earlier studies and is dealing with population sex ratio status of *Puntius sarana*.

2. MATERIAL AND METHODS

Study site and sample collection

The total 600 fishes were captured on monthly basis during April 2015 to March 2016, from Godavari River at Nanded region with the help of local fishermen. Fish collected in fresh condition were numbered, weighed in total body weight (to the nearest gram, g) and measured in total body length (to the nearest centimeter, cm) then preserved in 5% formalin. To identify the sex of fish each fish was dissected and sex was identified bases on the macroscopic characteristics of gonads.

Results and Discussion

The monthly variation in the population sex ratio of *Puntius sarana* is showed in Table 1. The fishes were grouped in 3 cm size group and sex ratio was studied in relation to the different months and size group as shown in Table 1 and Table 2 respectively. From the monthly distribution of the two sexes it can be noted that the female occurring more in number. The ratio was seen fluctuate during the year. In general female seem to abundant in the population, the ratio being male 0.36



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Reproduction of Neon Tetra (*Parachanna innesi*) Under Controlled Conditions

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DOI: <https://doi.org/10.5281/zenodo.7544199>

Published Date: 17-January-2023

Abstract: Studies on reproduction of Neon tetra were carried under controlled conditions. Neon tetra is a species popular for keeping in aquaria. It was established that spawners of this species produce viable gametes during a few (5-6) spawning periods only; later, although they get involved in reproduction viable issue cannot be obtained from them. From the breeding perspective fish of that species should be reproduced again shortly after the completed spawning and that time should be from 5 to 15 days. Excessively long keeping the fish between spawning periods results in a significant deterioration in quality of gametes expressed by the decreased number in obtained issue. It was shown that before spawning spawners should be kept in water at 22°C. The negative effect of keeping the reproducers in water at 25°C accumulated with time.

Keywords: Neon tetra, controlled reproduction, hatch, Aquarists.

I. INTRODUCTION

Aquaculture is not only breeding fish for consumption but also breeding ornamental species (Tusty 2002, Cek, Gokce 2005, Chelappa Et Al. 2005). Breeding of aquarium fish develops particularly dynamically in Asia although recently extensive development has also been observed in some European countries, e.g. Czech Republic. Characidae living mainly in the tropical waters of South America are one of the groups of ornamental fish commonly bred worldwide. The best-known representatives of that group are Neon tetras. That group also includes other tetras, This is a small fish in captivity reaching ca. 3-6 cm in total length. In the natural environment it is most numerous in the La Plata basin. The species was imported to Europe in 1922. Considering its size, it is a relatively fertile fish. During a single spawning act that is extended over time and usually takes from 2 to 4 hours, the female lays even over 2000 grains of eggs (KUJAWA 2000). The larvae hatch in most cases within 24 hours from fertilization of the eggs. That species is found in two colors: natural and albino. The natural (wild) form has red and blue, shiny body. A horizontal blue belt runs posterior side of the body It has a light-blue back over a silver-white abdomen. The genus is characterized by an iridescent blue horizontal stripe along each side of the fish from its nose to the base of the adipose fin, and an iridescent red stripe that begins at the middle of the body and extends posteriorly to the base of the caudal fin.

The eye iris is silvery-gray and the pupil is black. In case of albino form the body is yellowish-orange and the odd fins are intensely red. A white horizontal belt runs along the body. The eye pupil is red and the iris is white. Very limited number of reproductive acts during which the fish produce viable gametes is one of the characteristics of small body size fish belonging to the Characidae family. In case of some species such as cardinal tetra (*Parachanna axelrodi*) or neon tetra (*Parachanna innesi*) the number of such acts can be just two or three. The quality of gametes and number of offspring obtained can also be influenced by other factors such as feeding, water temperature, light conditions or length of interval between consecutive reproductive acts (BROOKS et al. 1997, TARGOŃSKA 2007).



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Effect of temperature on incubation period and hatching of neon tetra *Paracheirodon innesi* eggs

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DOI: <https://doi.org/10.5281/zenodo.7376648>

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Abstract: In the commercial development of freshwater ornamental fish culture, provision of appropriate temperature for egg incubation and further development of the fish at various stages is an important aspect in successful attainment of seed production. Little work has been done on the breeding of *Paracheirodon innesi*. Since, this species is very temperature sensitive, the study was conducted to determine the effect of different temperatures on breeding behaviour, hatchability and larval rearing of *P. innesi*. Broodstock were fed three times a day with bloodworms, tubifex and cladocerans at 4% body weight. Artificially fertilized eggs of neon tetra *P. innesi* obtained after spawning of cultured broodstock were incubated at temperatures of 18, 20, 22, 24 and 26°C in triplicates. The results showed that the optimal temperature for neon tetra embryonic development ranged from 22 to 26°C. Highest (70 ± 1.9 %) mean hatching percentage of eggs was observed at 26°C, whereas, the lowest (52.2 ± 4.8%) was observed at 18°C (P < 0.05). The incubation period varied inversely with temperature. Eggs took 38 - 40 hours for hatching at 18°C while it took only 24 - 26 hours at 26°C (P < 0.05). Based on the results of the present experiment, the temperature range of 24 to 26 °C can be recommended as optimum temperature for artificial propagation, larval rearing and higher survival of *P. innesi*.

Keywords: neon tetra, *Paracheirodon innesi*, temperature, embryonic development, hatching success.

1. INTRODUCTION

Ornamental fish keeping is the second most popular hobby in the world after photography and ornamental fishes are the most popular pets liked by people in the world. An estimated one billion ornamental fish are exported annually (Dykman, 2012). The world export value in 2010 was over US\$ 350 million and since 1985 the value of international trade in exports of ornamentals has been increasing at an average growth rate of approximately 14% per year. The main exporting countries includes Singapore, Malaysia and Thailand. Brazil and Columbia are also significant exporters. The main importing countries include Germany, Japan, Singapore, the US and the UK. The neon tetra is the most widespread and colourful aquarium fish among the tetras. They are frequently mentioned as aristocrats of the small aquarium. It is also termed as the jewel in the aquarium tank. Their colour is magnificent and a school of neon tetras competing about catching beams of sunlight is quite a sight. Compared with the guppy *Poecilia reticulata*, the neon tetra has become one of the most popular ornamental fish kept in household. During a single month, an average of 1.8 million of neon tetras, with an estimated value of US\$ 175000 were imported by the United States for the aquarium trade (Chapman *et al.*, 1997).

The neon tetra is described as 40 mm long, luminously coloured freshwater fish with a dark olive-green back over a silver-white abdomen. The fish is characterized by a shimmering blue-green lateral body stripe that covers from the head to the base of the adipose fin. A broad, shining red stripe begins at the middle of the body and extends posteriorly to the base of the caudal fin. The fins are transparent and colourless (Myers, 1936). There are three main sister species of neon tetra *P. innesi* (Myers, 1936), *P. axelrovi* (Schultz, 1956) and *P. simulans* (Günther, 1963).



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Research Article

OREOCHROMIS NILOTICUS [LINNAEUS, 1758] ITS BIOMEDICAL BENEFITS FOR CHILDREN'S

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ABSTRACT

Nile Tilapia (*Oreochromis niloticus*) it is fresh water & estuarine species. By lipid test profile, Analytical method, Chromatography method, Enzyme method, it has pharmaceutical potential to prevent Polyunsaturated fatty acid, Vitamin B12, Vitamin D etc. We found in Nile Tilapia have biomedical and nutraceutical products, Nile tilapia highly recommended for supplementary food for children.

KEYWORDS

Biochemical properties, pharmaceutical potential, Tropical fresh water fish.



INTRODUCTION

Common name Nile Tilapia (*Oreochromis niloticus*) identified by colour, morphometric & meristic

characters by Day volume. It is commonly called as "papit" in Maharashtra, India. Native of Nile middle


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Fecundity of Fish *Notopterus chitala* (Hamilton, 1822) from Godavari River, at Nanded (Maharashtra), India

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Published Date: 24-April-2024

Abstract: Fecundity is reproductive capacity of a fish determined by the number of eggs stored in each spawning season and its knowledge is extremely important in successful management and exploitation of its fishery.

All together 10 specimen of *Notopterus chitala* were examined with a view to determine the average number of eggs produced by each species and also to find out the relationship between fecundity and variables such as total length, body weight, gonad length and gonad weight of the fish.

By using (Lacane, 1951) equation follows the relationship between fecundity and variables are calculated.

The fecundity of *Notopterus chitala* is ranged from 133 to 1803.

Keywords: Fecundity, *Notopterus chitala*.

1. INTRODUCTION

Fecundity is reproductive capacity of a fish determined by the number of eggs stored in each spawning season and its knowledge is extremely important in successful management and exploitation of its fishery.

Studies on fecundity are receiving much attention as they play a key role in fish stock management. This is most important aspect of fishery biology.

The analysis of fecundity data in relation to size and weight of the fish has often been used to provide a reliable index of density dependent factors affecting the population of physico-chemical factors affects fecundity. Dense population of fish brings in intra and inters specific competitions for food and reproduction.

Fecundity indicates the number of ova produced by the fish to form the crop of season. The number of eggs produced may differ in different species with differences in size and age of fish.

Franz (1940) and Clark (1934) have observed that the fecundity in fishes increases in proportion to the square of the length. Hickling (1940), observed that the fecundity increased at a rate above the cube of the length in Herring of Southern North area. Simpson (1951) concluded that the number of eggs is related to the volume and consequently to the cube of the length. Lehman (1953), found straight relationship between the fecundity and length there is a direct proportional in fecundity with increase in length, weight and age of the fish.


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Toxicological Effects of Heavy Metal Nickel on Carbohydrate Content of Liver Tissue of Fresh Water Fish Tilapia Mossambica (Peters)

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Abstract

Pollutants can be degradable, non degradable and biologically accumulative. Heavy metals are non degradable type of pollutants. Heavy metals are those that exist as cations under biologically significant conditions. Typically the heavy metals occur as salts and other combined forms rather than as elements. Some eighty elements of more than 100 may be classified as metals and of them about three quarters can be regarded as heavy metals. The most biologically significant and most studied of these heavy metals include Cadmium, Mercury, Lead, Zinc, Chromium and Copper. Nickel is also one of the elements that are regarded as heavy metal.

The sugar level in Liver tissue in the animals treated with lower concentration indicated a significant increase with increase in period of exposure while the liver glucose level decreased due to higher concentration.

Keywords: Pollutants, Heavy Metals, Nickel Nitrate.

Introduction

Metals such as silicon, lead, mercury and zinc etc. are known to produce hazards on aquatic animals. The heavy metals and their salts reach the aquatic environment from industrial units, (Bryan,1971).

Starting with the effects of Minamata disease caused by the consumption of mercury contaminated shell fish and Itai itai caused by consumption of food contaminated with cadmium, awareness about effects of heavy metals on human has increased. In United Kingdom, a series of white papers (U.K. 1971, 1972a, 1972b) has been published on problems of heavy metal concentration in aquatic food. Entry of these substances into the food was established by Gaskin et.al.(1973) and Kamps et.al (1977). The accumulation of metals and their salts possess a number of threats to human as well as to ecosystem.

Material And Methods

For present study, healthy fishes (Tilapia mossambica, (Peters)) having equal size, measuring 20 cm and equal weight nearing 200 gm, were collected from Shikhachiwadi Lake located about 30 km away from Nanded city. Fish were transported by car, keeping them in plastic container having 50 liter water capacity. Firstly fishes were acclimatized for seven days in Raceways constructed in N.E.S. Science College, Nanded, campus and then in plastic tubs having water capacity of 50 lit in Laboratory for next seven days.

Preliminary studies were conducted using Nickel Chloride to find out the lethal concentration LC50 for 24 hours by following the method of Finney (1978). Fish were then exposed to sub lethal concentrations of Nickel Nitrate for 24, 72 and 96 hours, fish from control and experimental medium were dissected out and Liver was gently separated and preserved in deep fridge keeping them in plastic container. Extract of Liver tissues was made in distilled water by using homogenizer.





Studies on Ponderal Index of Rohitee Catfish

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Abstract:

Ponderal index, condition factor or coefficient of condition forms an important biological measure usually used in fish biology research to express the relative condition of a fish and provide additional information on various aspects such as maturity, spawning, feeding intensity etc. related to the well being of a fish.

It is seen from the table that 'K' values are more in the month of November and then they slowly decrease up to March which may indicate that the better condition of fishes in winter months.

Key words: Ponderal index, 'K' value, Rohitee catfish.

Introduction:

Ponderal index, condition factor or coefficient of condition forms an important biological measure usually used in fish biology research to express the relative condition of a fish and provide additional information on various aspects such as maturity, spawning, feeding intensity etc. related to the well being of a fish.

The coefficient of condition is generally denoted by 'K' is an important biological measure. The Ponderal index is also adopted to study the condition of the fish during different seasons and different stages of growth.

The changes in condition have usually been analyzed by means of condition factor or coefficient of condition 'Ponderal index' etc. Thompson (1942), Hille (1936). This is calculated as a ratio between the observed weight ~~and that expected~~ ^{lit. wt. (W) and length (L)} from the observed length. The basis of the expected weight is that for an ideal fish in whose length weight relationship formula

(1) $W = aL^3$, $n = 3$ and thus obeys the cube law. Various types of condition factor have been used, but in one of the original ones, the condition was measured by the constant by the constant equivalent to a in (1) $W = cL^3$, therefore, $C = W/L^3$.

As however c when calculated in often awkward decimal number the average value of c found by formula and a new condition factor 'K' found that would vary about unity.

$$K = W/cL^3$$

The value of c depends partly on the units used for weighing and measuring the fish. In instances where the original value of c chosen was found to average about some value approximating to, but not exactly 1, c has been further altered to a convenient round number and often changed into its reciprocal, $K = cW/L^3$. For example $K = 100 W/L^3$ (Hille, 1936). Where L is in centimeter and W in grams.

Kagwade (1968), states that the weight of the fish is not vary with the cube of its length. Any deviation from this relationship has been attributed to physiological changes in the fish. Changes in the condition factor may be due to the season and size.

Several other workers have been made investigations on the condition factor of different species and correlated the variation in 'K' values with various factors in life of fish. Hickling (1930, 1940), Hille (1936), Thompson (1942), Menon (1950), Le Cren (1951), Sarojini (1957), Appanna (1966), Kagwade (1968) and Ely (1968), Bhatt (1968, 1971), Parulekar and Bal (1971),





Toxicity Evaluation of Nickel Nitrate on The fresh Water Fish Tilapia Mossambica (Peters)

Ankita Manjaramkar, U.A. Manjaramkar, C.S. Blawate
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Abstract:

Nickel is a nutritionally essential trace metal for at least several animal species, microorganism and plants and therefore either deficiency or toxicity symptoms can occur when too little or too much Nickel is taken up. Although a number of cellular effects of nickel have been documented, a deficiency state in humans has not been described.

Tilapia fish are selected as a model organism because these fishes can be cultured and they are economically important. Tilapia is having a tendency to identify the metals. They can absorb metals from water through gills, skin and digestive tract. This study aims to describe toxicological effect of Nickel Nitrate on fresh water fish Tilapia mossambica.

Key words: Toxicology, Nickel Nitrate, micro organisms.

Introduction:

Pollutants can be degradable, non degradable and biologically accumulative. Heavy metals are non degradable type of pollutants. Heavy metals are those that exist as cations under biologically significant conditions. Typically the heavy metals occur as salts and other combined forms rather than as elements. Some eighty elements of more than 100 may be classified as metals and of them about three quarters can be regarded as heavy metals. The most biologically significant and most studied of these heavy metals include Cadmium, Mercury, Lead, Zinc, Chromium and Copper. Nickel is also one of the elements that are regarded as heavy metal.

Material And Methods:

For present study, healthy fishes (Tilapia mossambica, (Peters)) having equal size, measuring 20 cm and equal weight nearing 200 gm, were collected from Shukhachiwadi Lake located about 30 km away from Nanded city. Fish were transported by car, keeping them in plastic container having 50 liter water capacity. Firstly fishes were acclimatized for seven days in Raceways constructed in N.E.S. Science College, Nanded, campus and then in plastic tubs having water capacity of 50 lit in Laboratory for next seven days.

Studies were conducted using Nickel Nitrate to find out the lethal concentration LC50 for 24 hours by following the method of Finney (1978).

Results And Discussion:

In order to investigate behavioral changes and LC 50 in fish Tilapia mossambica, 5 different concentrations of heavy metal Nickel were selected as 0.025, 0.05, 0.01, 0.015 and 0.0175%. Nitrate salt of Nickel was selected as a toxicant. Before treatment the fish were grouped in six groups (5 experimental and 1 control) comprising of 10 animals each, placed in individual plastic tubs having 50 liter water capacity. The experiment was conducted for 24, 72 and 96 hours.

LC 50 for 24 hours was found to be 0.05%. The overall effects of treating the fishes with different concentrations of Nickel Nitrate included gasping (Plate 1), hyper excitation, fading of color (Plate- 2), rapid opercular movements, swelling of opercular region (Plate-3).





Studies on Protein Content of Labeo Bata

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Abstract:

Fish is an easily perishable commodity and deteriorating in quality is due to the changes taking place to the various constituents like protein, lipids etc. Information on the biochemical constituents will help a processing technologist to define the optimum processing and storage conditions, so that the quality is preserved to the maximum extent. Present study reveals that the protein content of fish increases on onset of maturity and it decreases after spawning.

Key words: Protein, Lipid, Labeo bata.

Introduction:

Fish is known as an important source of food and also provide certain other useful products and hence it has a great significance in the life of mankind. Balanced diet is very essential for satisfactory growth and health human beings. Imbalanced diet causes many abnormalities and diseases. To face and in order solve this problem satisfactorily and to fulfill the fundamental requirements of a balanced diet, the natural resources at common have to be explored. Fish is one of the good natural resources, which can be easily explored from aquatic environment and plays an important role in the food of mankind. The existing protein malnutrition in this country would be overcome by increasing the supply and consumption of fish. Fish is normally consumed by the all the class of people and comes up to the requirements as a first class protein food. Among the three important energy yielding constituents of food, mainly protein, carbohydrate and fat, the fat yields the highest amount of energy.

Material and Methods

The material which forms a base of this study was collected from Local Fish Market, i.e. Budhiwara fish market. The specimen after having brought to the laboratory, skin was removed and muscles were collected, cure was taken to see that, no piece of bone was mixed with them. Each muscle sample was weighed accurately. Then the extract was prepared in distilled water.

Protein was estimated by using Biuret method. Standard solution of protein (Albumin 10 mg/ ml) was freshly prepared. From this standard solution different solutions of the protein ranging from 1mg/ ml to 10mg/ ml were prepared in distilled water.

In a series of test tubes the 2 ml standard protein was taken. To this 3 ml of Biuret reagent was added, it was mixed thoroughly and warmed at 37° C for 10 minutes. The test tubes were cooled under tap water and absorbance of the contents of each tube was recorded at 540nm against proper blank. A graph was plotted for absorbance versus protein concentration and a standard calibration curve was constructed. From the standard calibration curve, concentration of unknown protein sample solutions was determined.

Results and Discussion

Analysis of protein of the body muscles have been carried out. The results were tabulated in Table number 1 and Figure number 1.

Table No. 1. Monthly fluctuations in the percentage of Proteins of the Muscle of Labeo bata





Effects of Heavy Metal Nickel on Carbohydrate Content of Muscle Tissue of Fresh Water fish Tilapia Mossambica (PETERS)

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Dept. of Zoology, Science College, Nanded

Abstract:

Nickel is a nutritionally essential trace metal for at least several animal species, microorganisms and plants and therefore either deficiency or toxicity symptoms can occur when too little or too much Nickel is taken up. Although a number of cellular effects of nickel have been documented, a deficiency state in humans has not been described.

Nickel and Nickel compounds have many industrial and commercial uses and the progress of industrialization has led to decreased emission of pollutants in to ecosystems. Although nickel is omnipresent and is vital for the function of many organisms, concentrations in some areas from both anthropogenic release and naturally varying levels may be toxic to living organisms.

The main aim of this study is to study the effect of Nickel Nitrate on carbohydrate architecture of fresh water fish Tilapia mossambica (Peters).

Key Words: Nickel Nitrate, Heavy Metal, Tilapia mossambica

Introduction

Metals such as silicon, lead, mercury and zinc etc. are known to produce hazards on aquatic animals. The heavy metals and their salts reach the aquatic environment from industrial units, (Bryan, 1971).

Accumulation of heavy metal in digestive gland of Bivalve, Pareausia cylindrical reported by Pardeshi and Zambare, (2007). Decline in oxygen consumption and gradual increase in the blood glucose level was reported in Clarius batrachus due to Copper Sulphate by Siddiqui, (2007).

Symptoms of nickel toxicity include skin rashes (called Nickel dermatitis), nausea, dizziness, diarrhea, headache, vomiting, chest pain, weakness and coughing. Contact with nickel vapor can lead to swelling of the brain and liver, degeneration of liver, irritation of eyes, throat and nose and various types of cancer.

Material And Methods:

For present study, healthy fishes (Tilapia mossambica, (Peters)) having equal size, measuring 20 cm and equal weight nearing 200 gm, were collected from Shikhalwadi Lake located about 30 km away from Nanded city. (Plate -1). Fish were transported by car, keeping them in plastic container having 50 liter water capacity. Firstly fishes were acclimatized for seven days in Raceways constructed in N.E.S. Science College, Nanded, campus and then in plastic tubs having water capacity of 50 lit in Laboratory for next seven days.

Preliminary studies were conducted using Nickel Chloride to find out the lethal concentration LCS₅₀ for 24 hours by following the method of Finney (1978). Fish were then exposed to sub lethal concentrations of Nickel Nitrate for 24, 72 and 96 hours, fish from control and experimental medium were dissected out and Muscles were gently separated and preserved in deep fridge keeping them in plastic container.





Nesting and Breeding of Common coot (*Fulica atra*) (Aves: Rallidae) in Ujani-Bhigwan reservoir Maharashtra, India

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Abstract

In present investigation nesting and breeding of common coot (*Fulica atra*) from Ujani-Bhigwan reservoir, Maharashtra, India. Total 56 nests were observed in study area, in which 31 eggs and 68 chicks were observed. Parameters such as depth of water, nest distance from river bank, shape of nest and nest material were assessed in this research. Nest construction, Parental care, and feeding to youngones are contributed by both of parents. The *Typha angustifolia* and *Ipomoea carnea* was main base for the nest construction of common coot (*Fulica atra*). Predator, over fishing, pollution, illegal sand mining, tourist activities and anthropogenic activity are threats identified to the nest of common coot (*Fulica atra*). It is an important primary data-base for this nesting site of Common coot with major details fist-time.

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Key words - Bird Nest, Common coot, Nest Material, Ujani-Bhigwan reservoir, Nesting ecology.

Introduction

Birds are crucial for the functioning of the world ecosystem (Balen, 1989) and these are sensitive to environmental changes (Kushlan, 1993) and they play important role in health of human (Chavan et al., 2023). In India, 12% of the 1395 bird species are already facing series impact by habitat loss that includes decreased water bodies, wetlands and forests (ENVIS-BNHS). Overexploitation, unsustainable resource use, population growth and climate change have led to a loss of biodiversity. These changes are causing negative impacting the life cycle and survival of migratory birds.

The Ujani reservoir Wetland was created in 1980 and is situated in the Western Ghats' rain shadow zone. With an annual rainfall of 500mm, it has a catchment area of 14,856 sq. km and water spread area of reservoir 357 sq. km. Since the completion of this dam for drinking water in 1980, water has also been made available for irrigation supporting the growth of cash crops. Since 1980 it has supported 230 local, migratory visitors and transit avifauna. According to a recent declaration as an established Important bird area (IBA) area (Chavan et al., 2020). Freshwater wetlands are at danger because of eutrophication, pollution, a drinking water shortage and poor water quality (Baisthakur et al., 2021; Darak et al., 2021; Puri et al., 2023). The Ujani-Bhigwan Reservoir also supports a huge number of local water birds, waders as well as migratory visitors and transit passenger birds making it an essential element of the wetland ecosystem. Bird constructs various types of nest for protection against environmental factor, breeding process and to care of the brood, birds construct nest with the help of material which is available locally (Jadhav et al., 2018). Common coot (*Fulica atra*) is a water bird, categorized as "Least Concern" in the IUCN bird database. It is a

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Drug-resistant Bacterial Pathogens: Isolation and characterization in freshwater fish *Catla catla*

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Abstract

This study aimed to identify and characterize the causative agent of microbial illnesses in a freshwater aquacultured *Catla catla*. Along with water samples, a total of 10 fish samples exhibiting clinical indications of illnesses such as hemorrhagic septicemia were gathered. Using morphological, biochemical, and molecular methods, bacteria were characterized. Antibiotics sensitivity test showed that isolate FP04, FP07 and FP10 were shown very little sensitivity towards most of antibiotics. FP04 shown complete resistant towards Cotrimoxazole and Tetracycline, FP07 shown resistance against Cotrimoxazole while FP10 was fully resist to Nitrofurantoin antibiotic. All water quality measurements, with the exception of temperature, ammonia, and free CO₂, were within normal limits. The existence of antibiotic-resistant bacteria in *C. catla* afflicted by hemorrhagic septicemia is confirmed by this investigation. By consuming these aquatic goods and by-products, humans may become infected with these antibiotic-resistant bacteria. Therefore, for an efficient disease control plan, the sensitivity of these bacteria to antibiotics should be regularly assessed.

Keywords: *Catla catla*, drug resistant fish pathogens, isolation, identification

Introduction

Over the past few decades, the global aquaculture sector has grown at an average annual pace of 6.6%, exceeding the increase of the human population (Nadarajah and Flaaten, 2017) [21]. The industry is essential to the growth of the economy. Despite this industry's significant contribution, aquaculture's performance is frequently dictated by how well diseases are managed (Israngkura and Sao-Hoo, 2002, Hasimuna *et al.*, 2023) [17]. These days, Maharashtra's several districts are concentrated on the polyculture of large Indian carps (Das and Ferozekhan, 2022). The most well-liked carp species is *Catla catla*, a native fish of the region's riverine ecosystem (Bals, 2018) [14]. It is a common food fish in India and plays a significant role in the region's polyculture system because of its faster growth rates and better economic worth. Fish raised in fish farms are frequently more vulnerable to certain pathogens, particularly when the weather is colder. *Pseudomonas* sp. caused outbreaks of severe illnesses such as hemorrhagic septicemia, gill necrosis, abdominal distension, splenomegaly, friable liver, and congested kidney have been linked to significant economic losses (Ardura *et al.*, 2013 [3] and Algammal *et al.*, 2020) [2].

Variable clinical indications, including as hemorrhages on the skin, fins, and other body parts, are indicative of the condition. The pathogens also attack the fish's internal organs and muscles if the disease lasts for extended periods of time (Overstreet and Hawkins, 2017) [27]. As a result, efforts were conducted in this study to identify the most resistant fish pathogens as well as to isolate the fish pathogens linked to the *Catla catla*. These steps were followed by characterizing the isolates and determining their pattern of antibiotic sensitivity. To ascertain the efficacy of regularly used antibiotics for the treatment of this condition, antibiotic sensitivity was also investigated.

Materials and methods

Collection of Fish and Water Samples

Attendance at outbreaks and the collecting of fish samples from the Vishnupuri Dam in Vishnupuri, Nanded, Maharashtra, were included in the study. This dam is utilized for commercial fish farming and water storage. The postmortem lesions of generalized septicemia surrounding the anus, together with the expansion of the gill bladder and the yellowish hue of the air bladder, were the criteria used to select the moribund fish samples (n = 10). Fish samples were taken, placed in sterile plastic bags, kept cold, and sent straight to the lab for analysis. Water quality measures, such as temperature, dissolved oxygen, CO₂, pH, total alkalinity, total hardness, ammonia, and nitrite, were tested on water samples that were taken from several dam locations.

Analysis of water

Temperature and pH were measured at the sampling site (Golterman *et al.*, 1978) [13]. While other water quality indicators including Dissolved Oxygen (DO), Carbon Dioxide (CO₂), Total Alkalinity, Total Hardness, Ammonia Concentration and Nitrate concentration were measured in the lab with standard protocol. The association between the water quality indicators and hemorrhagic septicemia was then determined by comparing the observed values of the parameters with standard values (GOP, 2006 and Nural *et al.*, 2016) [24].

Isolation of Bacterial Pathogens

Fish samples collected from the aquaculture site were proceed for disinfection of fish skin with a 70% alcohol and absolute betadine solution, aseptic dissection took place in the lab. The liver, kidneys, spleen, and muscles of the infected fish were streaked in duplicate onto Nutrient Agar (HiMedia, Goa) and incubated for a full day at 37°C.





E–W strike slip shearing of Kinwat granitoid at South East Deccan Volcanic Province, Kinwat, Maharashtra, India

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We study the margin of South East Deccan Volcanic Province around Kinwat lineament, Maharashtra, India, which is NW extension of the Kaddam Fault. Structural field studies document ~E–W strike-slip mostly brittle faults from the basement granite. We designate this as 'Western boundary East Dharwar Craton Strike-slip Zone' (WBEDCSZ). At local level, the deformation regime from Kinwat, Kaddam Fault, micro-seismically active Nanded and seismically active Killari corroborate with the nearby lineaments. Morphometric analyses suggest that the region is moderately tectonically active. The region of intense strike-slip deformation lies between seismically active fault along Tapi in NW and Bhadrachalam in the SE part of the Kaddam Fault/lineament. The WBEDCSZ with the surface evidences of faulting, presence of a major lineaments and intersection of faults could be a zone of intraplate earthquake.

Keywords. Deccan trap; brittle and ductile faulting; lineaments; tectonics.

1. Introduction

Observations of deformations in Deccan Volcanic Province (Kaplay *et al.* 2013; Misra and Mukherjee 2015; Babar *et al.* 2017; Kaplay 2017; Mukherjee *et al.* 2017) and microseismic activities (Gupta and Joshi 2001; Srinagesh *et al.* 2012; Subhadra *et al.* 2015) around Nanded (Maharashtra, India) prompted us to investigate the tectonics of the South East Deccan Volcanic Province (SEDVP). The region SE of SEDVP has tectonic imprints of Precambrian age, reactivated during Tertiary (Sengupta *et al.* 2013). The faulted block west of the

Kaddam Fault (KF) is tilted towards south near the Adilabad region during the Quaternary.

The Kinwat region is part of the 'South East Deccan Volcanic Province', with ancient basement granite complex. Below the Deccan trap basalts lies the granite body. Neoproterozoic Pakhal sediments overlie the Kinwat granitoids (Banerjee and Shivkumar 2010a). The Kinwat granitoids is a part of the eastern Dharwar Craton. N–S transcurrent strike slip deformation has been reported from this craton (Jayananda *et al.* 2000). Tabular- and lens-shaped mafic enclaves are usually found in the basement granites and granitoids.



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ADMISSIBILITY AND ASYMPTOTIC BEHAVIOR OF SUMMATION EQUATION

Ambadas Deshmukh¹, A.B. Jadhav², P.U. Chopade³ and K.L. Bondar⁴

Abstract: In this paper, we concern with summation equation of the type

$$x(p) = h(p) + \sum_{p_0}^{p-1} K(p, s) f(s, x(s)).$$

The concept of admissibility of a pair of subspaces with respect to an operator is introduced. Moreover, asymptotic behavior of above summation equation is discussed.

2006 AMS Mathematics Subject Classification: 35A10, 35A02.

Keywords: Summation equation, admissibility and asymptotic behavior.

1. INTRODUCTION

Agarwal [1], Kelley and Peterson [2] developed the theory of difference equation and difference inequalities. Existence of solutions for some summation equations is obtained by K.L. Bondar, A.B. Jadhav and M.R. Pawade [3]. K.L. Bondar and M.R. Pawade studied some summation inequalities reducible to difference inequalities are given in [4]. Some differential and integral inequalities are given in [7]. K.L. Bondar contributed δ -approximate solution of summation equation in [5, 6]. In this paper we study summation equation of the type

$$x(p) = h(p) + \sum_{p_0}^{p-1} K(p, s) f(s, x(s)) \quad (1.1)$$

Moreover, the concept of asymptotic behavior of above summation equation is discussed.

2. DEFINITIONS AND PRELIMINARY NOTES

Let $J = \{p_0, p_0 + 1, p_0 + 2, \dots, p_0 + a\}$, $p_0 \in R_+$, the set of all nonnegative real numbers. In order to obtain better results concerning equation (1.1), we need the concept of admissibility of pair of subspaces with respect to an operator.

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SOME COMPARISON RESULTS IN DIFFERENCE EQUATIONS

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Abstract: In this paper, we present some comparison results regarding first order difference equation using supremum type difference.
Keywords: Difference Equation, Comparison Theorems, Maximal solution.
2006 AMS mathematics subject classification: 35A10, 35A02.

1. INTRODUCTION

Agarwal [1], Kelley and Peterson [11] developed the theory of difference equations and difference inequalities. Existence of solutions for some summation equations are obtained by K. L. Bondar, A. B. Jadhav and M. R. Pawade [10]. K. L. Bondar and M. R. Pawade studied some summation inequalities reducible to difference inequalities are given in [4]. Some differential and integral inequalities are given in [12]. K. L. Bondar contributed δ -approximate solution of summation equation in [8, 9]. K. L. Bondar, V. C. Borkar and S. T. Patil discussed some comparison results along with existence and uniqueness for the first order difference equation in [2, 3]. K. L. Bondar contributed some difference inequalities, solutions of summation equations and some summation inequalities in [5, 6, 7, 8, 9]. In this paper we present some comparison results regarding first order difference equation using supremum type difference.

2. DEFINITIONS AND PRELIMINARY NOTES

Consider the difference equation

$$\Delta x(t) = f(t, x), x(t_0) = x_0, t_0 \in J, \tag{1.1}$$

where $f \in C[J \times R, R_+]$, $J = [t_0, t_0 + 1, t_0 + 2, \dots, t_0 + a]$, $t_0 \in R_+$, the set of all nonnegative real numbers.

Definition 2.1 For $V \in C[J \times R, R_+]$, we define the function

$$\Delta^+ V(t, x) = \sup_{t \in J} [V(t + 1, x + f(t, x)) - V(t, x)] \tag{1.2}$$

for $(t, x) \in J \times R$.

Definition 2.2 Let $r(t)$ be any solution of (1.1) on J . Then $r(t)$ is said to be maximal solution of (1.1), if every solution of (1.1) existing on J , the inequality $x(t) \leq r(t)$ holds for $t \in J$.



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A STUDY ON OPTIMIZATION TECHNIQUES FOR SOLVING CONSTRAINED NON LINEAR PROBLEMS

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Abstract

In real world, we usually come across the constrained non-linear optimization problems (CNLP) which bounds on the decision variables and the objective functions are either maximized or minimized under some constraint. In recent past, there have been many traditional and heuristic algorithms to solve CNLP. Lately, the Excel Solver and MATLAB® toolboxes have made use of Genetic Algorithms as an inbuilt function in order to solve CNLP. This paper studies various optimization techniques which are in use in order to solve the constrained non-linear problems.

Keywords: constrained non-linear problem; heuristic algorithms; evolutionary algorithms

1. INTRODUCTION

The non-linear problems are more frequently encountered while modeling the real time systems and hence the non-linear problems have attracted researchers. As the nature of non-linear problems is complex, they can be encountered in our day to day life. Manually solving the non-linear is next to impossible as it involves the mathematical rigidity of the properties that are to be satisfied. When compared to the linear problems, non-linear are far more difficult to be solved. Hence making use of computing resources could be of great help to the researchers those who are willing to work in the domain of non-linear problems. Many a times, in order to make a non-linear into a linear problems, many approximations are done and

thereby reducing the efficiency and could be of no help in the real life problem.

General form of a non-linear problem is:
Optimize $f(X)$ Subject to constraints
 $g_j(X) (\leq \geq) b_j, j = 1, 2, \dots, m$

Where $X = (x_1, x_2, x_3, \dots, x_n)$

There have been many evolutionary algorithms and techniques that are available for the purpose of solving the constrained non-linear problem. The major problem faced in this domain of non-linear problems is that, a technique that is suitable for solving a particular non-linear problem would be highly inefficient for some other non-linear problem and hence there is a high risk in choosing any particular technique in order to solve a particular non-linear problem.

Starting with the Random Search Technique (RST) which was developed in 1965 by Prince and later it was improved by C Mohan and Kusum Deep as they made use of FORTRAN to solve the problems. Also since then, there have been many versions of the random search technique which have been based on higher level programming languages like C, C++ [1]. After the RST came the Genetic Algorithms (GA) and their hybrids [2], [3] and [4] which are majorly based on evolution and this got accepted by many researchers round the world in order to solve some complex non-linear problems. There have also been many heuristic algorithms and their hybrids which have been used in the non-linear problem solving. Particle Swarm Optimization [5], [6], [7], Ant Colony Optimization [8], and many more are the well-

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A Review on the Algorithms used for Constructing Experimental Designs in Conjoint Analysis

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Abstract—For the purpose of measuring the consumer preferences for products or services, the technique used is the conjoint analysis. The conjoint analysis is one of the methods of finding the possible reaction of the consumer on a particular product or a particular service. One of the basic problems in performing conjoint analysis is how to generate experimental designs. The purpose of an experimental design is to give a rough overall idea as to the shape of the experimental response surface, while only requiring a relatively small number of runs. These designs are expected to be orthogonal and balanced in an ideal case. In practice, though, it is hard to construct optimal designs and thus constructing of near optimal and efficient designs is carried out. In this paper, review on the basic criteria of the design efficiency and some algorithms will be discussed which can be used for its construction.

Keywords—Conjoint analysis, experimental design, efficiency, optimality criteria, algorithms

I. INTRODUCTION

Lately, the importance of preference analysis techniques and its usage has grown rapidly. The importance of preference analysis techniques could be understood by its wide spread use for the purpose of new product development and manufacturing and also in the diverse areas like marketing, financial services etc. In marketing research, for example, preference measuring techniques may provide answer to questions as to which product will be successful or which attributes of a product drive the purchase decision and may thus serve as a valuable aid for managerial decision. One method that has become particularly popular in this context is Conjoint analysis.

Conjoint analysis is decompositional method [1] which assumes that product/services can be "break-down" into their attributive components and which implies study of joint effects of variety products' attributes on their preference.

In Conjoint analysis, respondents have to evaluate a set of alternatives that are represented by factorial combinations of the levels of certain attributes. In traditional Conjoint approach, the alternatives have to be rank ordered or rated on some graded scale. It is assumed that these preference judgments are based on the overall utility values of the considered profile's levels. These unknown parameters are than estimated from the data. If the data consists of ranking techniques from linear programming, nonmetric versions of ANOVA can be used. Variants of conjoint analysis that use rating scales are referred as metric conjoint analysis. Here, the utility values are usually estimated by least squares procedures. Because of the metric response format and the linear relationship between preference judgments and attributes it is especially this last type of conjoint analysis to which techniques from optimal design theory can be readily applied.

The quality of statistical analysis heavily depends on the alternatives presented in the experimental design. An experimental design is a plan for running an experiment. Experiments are performed to study the effects of the factor levels on the dependent variable. The factors of an experimental design are variables that have two or more fixed values or levels of the factors. In Conjoint analysis, the factors are the attributes of the hypothetical products or services, and the response is preference or choice.

Using all combinations of attribute levels, i.e. a full factorial design, the number of evaluations required from every respondent soon becomes prohibitively large when the number of attributes and/or levels increases. To deal with this problem, the application of formal experimental designs was suggested. Many of the researchers have proposed the use of orthogonal arrays, incomplete block designs and fractional factorial designs of different resolutions to reduce the number of evaluations to be performed. In this reduction process it is especially important the goodness of the reduced designs. This goodness is named as efficiency.

There are several ways to quantify the relative efficiency of experimental designs. The choice of measure will determine which types of experimental designs are favored as well as the algorithms for choosing efficient designs.

The paper is organized as follows. In Section 2 we study some of the fundamental concepts in Conjoint experimental design including standard factorial designs, as well as fractional factorial designs, orthogonal arrays and nonorthogonal designs. Design terminology introduces and design efficiency explains. Section 3 reviews the basic optimality criteria as measure of the design efficiency. There are many algorithms for constructing efficient experimental designs. Some standard algorithms are studied in Section 4. In Section 5 we give conclusions and further research directions.

II. STUDYING EXPERIMENTAL DESIGN IN CONJOINT ANALYSIS

The design of experiments is a fundamental part of Conjoint analysis. Experimental designs are used to construct the hypothetical products or services. A simple experimental design is the full-factorial design, which consists of all possible combinations of the levels of the factors. These combinations in Conjoint analysis are referred as profiles or concepts. For example, with five factors, two at two levels and three at three levels (denoted as 2^23^3), there are 108 possible combinations. In a full factorial design, all main effects, two-way interactions, and higher-order interactions are estimable and uncorrelated. The problem with a full-factorial design is that, for more practical situations, it is too costly and tedious to have subjects rate all possible combinations. For this reason, researchers

FUZZY UNBALANCED TRANSPORTATION PROBLEM BY USING MONTE CARLO METHOD

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ABSTRACT

In this article we consider fuzzy unbalanced transportation problem by using triangular fuzzy number. We find the initial solution by using fuzzy matrix minima method. The main objective of this paper is to find optimal solution to given unbalanced transportation problem using Monte Carlo Method i.e. by using triangular fuzzy random number. In general, transportation problems are solved with the assumptions that unit cost of transportation from each source to each destination, supply of the product at each source and demand at each destination are specified in a exact way i.e., in crisp environment. But in practice, many times we face the problem of incompleteness uncertain data, this is due to lack of knowledge about the considered system or changing nature of the world, the parameters of the transportation problem are not always exactly known and stable. Therefore we used the fuzzy logic to solve transportation problem. Fuzzy logic & techniques has been widely used in many areas such as engineering, business, mathematics, psychology, management, medicine and image processing and pattern recognition.

Keyword: Unbalance, Random Number, Monte Carlo Method.

INTRODUCTION

Transportation problem which has been used to solve different type of real life problems and generally studied in operation research field. Fuzzy logic deals with degrees of truth rather than the usual true or false (1 or 0) on which the modern computer technology is based. Fuzzy Set Theory gives the formalization of approximate reasoning, and preserves the original information contents of imprecision. Hitchcock (L 1941) first time developed the basic transportation problem. Appa (M 1973) discussed different method of the transportation problem. Prof. Zadeh (Z. L. A 1965) father of fuzzy mathematics introduced the concept of fuzzy numbers. Saad & Abbas (S. O. A 2003) discussed an algorithm for solving the transportation problems in fuzzy environment. Das & Baruah (K 2007) proposed Vogel's approximation method to find the fuzzy initial basic feasible solution of fuzzy transportation problems in which all the parameters are represented by triangular fuzzy numbers. Basirzadeh (H 2011) used the classical algorithms to find the fuzzy optimal solution of fully fuzzy transportation problems by transforming the fuzzy parameters into crisp parameters. Kaur & Kumar (K. A. A 2011) proposed a new method for

the fuzzy transportation problems using ranking function. Deepika Rani, T R Gulati & Amit Kumar (Deepika Rani 2014) developed method for unbalanced transportation problems in fuzzy environment. Ali Ebrahimnejad (Ebrahimnejad 2014) used the values of transportation costs are represented by generalized trapezoidal fuzzy numbers and the values of supply and demand of products are represented by real numbers. Here we concluded that once the ranking function is chosen, the FTP is converted into crisp one, which is easily solved by the standard transportation algorithms.

This paper is organized as follows. In section 2, the triangular membership function is defined. In the next section, the general transportation problem with fuzzy triangular numbers is discussed. This is followed by the solution of transportation problem using fuzzy triangular numbers in section 4. Section 5 illustrates the solution of transportation problem through a numerical example and Matlab programme is given. Finally, in section 7 conclusions are given.

Preliminaries:

Fuzzy set: A fuzzy set is defined by $\{(x, \mu_A(x)) : x \in A, \mu_A(x) \in [0, 1]\}$. In the pair $(x, \mu_A(x))$, the first element x belong to the classical set A , the second



FUZZY TRANSPORTATION PROBLEM BY USING TRAPEZOIDAL FUZZY NUMBERS

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ABSTRACT

A fuzzy set can be represented mathematically by giving a value representing its grade of membership in the fuzzy set to each possible individual in the universe of discourse. The part of uncertainty cannot be avoided by any branch of science, engineering, medical and management. Transportation problem deals with transportation or distribution of goods or services from several supply origins to several demand destinations and it is the main branch of operation research. In real-world transportation planning, decision problems, input data and related parameters, such as available supply and forecast demand, are often imprecise/fuzzy because some information is incomplete or unavailable. In this article, we have used the fuzzy trapezoidal numbers to obtain a best approximate solution to the fuzzy transportation problem.

Keywords: Fuzzy, Trapezoidal, FNWCM, FLCM, FVAM.

Introduction

In 1947, T.C. Koopmans developed a model called 'optimum utilization of the transportation system'. Due to these two significant contributions, there was a huge improvement in transportation problem, which involved number of trading sources and a number of trading destinations. Every trading source has certain capacity and every destination has a certain demand associated with a certain price of trading from the sources to the destination. The main aim is to minimize the transportation cost while meeting the demands of the destinations. In a fuzzy optimization problem, fuzzy random numbers gives an approximate solution. We are going to use fuzzy trapezoidal random numbers to obtain a best approximate solution to the fuzzy transportation problem. To solve a Mathematical problem which does not have an analytical solution can be solved by using random numbers which is computer-based experiment through the random numbers. The fuzzy programming approach to multi-objective transportation problem was started by Prof. A.K. Bit in year 1993 [5]. Later Chanas S. [6] [7] obtained an optimal solution to the transportation problem with fuzzy cost coefficients along with this he explained the method of solving the fuzzy integer transportation problem. Dymowa L [8] solved the transportation problem under probabilistic and fuzzy uncertainties. A. NagoorGani [9] applied simplex type algorithm for solving fuzzy transportation problem. S. Prashkumar [10] used modified Vogel's approximation method to study fuzzy transportation problems.

In this article first defined the α -cut and operations on fuzzy trapezoidal numbers, in the next section, Crisp transportation problem is converted into fuzzy transportation problem by using the trapezoidal fuzzy number. Crisp number x is converted into a trapezoidal fuzzy number using $[x-2d, x-d, x+d, x+2d]$ and solved by using FNWCM, FLCM and FVAM method. Finally, we discuss the result.

Basic Definitions

Fuzzy set:

A fuzzy set is denoted by \tilde{A} defined by $\tilde{A} = \{(x, \mu_A(x)) : x \in A, \mu_A(x) \in [0, 1]\}$. In the pair $(x, \mu_A(x))$, the first element x belong to the crisp set A , the second element $\mu_A(x)$, belong to the interval $[0, 1]$, called Membership function.

The support of a fuzzy set \tilde{A} is subset of \tilde{A} defined as $\{x \in A : \mu_A(x) > 0\}$

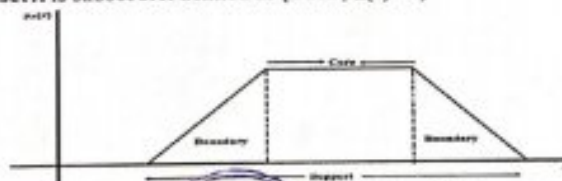


Figure 1: Core, Support, and Boundaries of a fuzzy set

Research Paper



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Existence and Approximations to Solution of Difference Initial Value Problems

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Abstract

The existence of Solution of difference equation

$$\Delta x(t) = f(t, x(t)), x(t_0) = x_0$$

is discussed. The successive of approximations to the solution of above IVP are discussed.

Keywords: Difference equation, Existence of solution summation Equations.

AMS subject classification: 39A5, 39A10

1 INTRODUCTION

In recent years, the theory and application of difference equations are found to be more useful in the Engineering field. Agarwal [1], Kelley and Peterson [5] had developed the theory of difference equation and difference inequalities. Some comparison theorems, summation difference inequalities are obtained by K.L. Bondar et al. [2-4]

In this paper, we will discuss the existence of the solution of difference equation

$$\Delta x(t) = f(t, x(t)), x(t_0) = x_0$$

(1.1)

Moreover successive approximation to the solution of above IVP are obtained.

2 EXISTENCE OF SOLUTION

Theorem 2.1: A function $x(t)$ is a solution of IVP of (1.1) on an interval I if and only if it is solution of summation equation.

$$x(t) = x_0 + \sum_{s=t_0}^{t-1} f(s, x(s)) \quad (2.1)$$

Proof. Suppose that $x(t)$ is a solution of IVP (1.1) then

$$\Delta x(t) = f(t, x(t)) \text{ where } x(t_0) = x_0 \quad t \in I = [t_0, t]$$

Taking summation from t_0 to $t-1$ then



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Existence of Mild Solution for Second Order Summation-Difference Equations

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Abstract: In this paper, we discuss existence and uniqueness of mild solution of second order initial value problems, with nonlocal conditions, by help of Banach fixed point theorem and the theory of cosine family.

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I. INTRODUCTION

In the present years, the study of difference equations and their applications are found to be more useful in the field of numerical and Engineering as well as social sciences. Agrawal [1], Kelley and Peterson [6], P. Eloe [5] had developed theory of difference equation and their inequalities. Some comparison theorems on difference equation and summation equation are obtained by K.L. Bondar et al. [2-4]

Let X be a Banach space with norm $\|\cdot\|$ defined by $\|x\|_b = \sup\{\|x\| : x \in B\}, t \in I$ in the closed interval $I = [a, b]$. Let $B = C(I; X)$ be Banach space of all continuous functions defined from I into X .

Consider the second order nonlinear summation-difference equation with nonlocal conditions:

$$\Delta[\Delta x(t-1) + g(t, x(t))] = Ax(t) + f\left(t, x(t), \sum_{s=0}^{t-1} k(t, s, x(s))\right), \text{ where } t \in I \quad (1.1)$$

$$x(0) = x_0 + q(x), \quad (1.2)$$

$$\Delta x(0) = y_0 + p(x), \quad (1.3)$$

where A is an infinitesimal small generator of a strongly continuous cosine family $\{C(t) : t \in \mathbb{R}\}$ in Banach space X , $f : I \times X \times X \rightarrow X$, $k : I \times I \times X \rightarrow X$, $g : I \times X \rightarrow X$, $q, p : B \rightarrow X$ continuous functions, and x_0, y_0 are elements in X

II. PRELIMINARIES AND HYPOTHESES.

In many cases it is advantageous to treat second ordered difference equations directly rather than to convert first order systems. We can study second order equations in the theory of the strongly continuous cosine family.

A one parameter family $\{C(t) : t \in \mathbb{R}\}$ of bounded linear operators mapping the Banach space X into itself is called a cosine family if and only if,

- $C(0) = I$ where I is identity operator,
- $C(t)x$ is strongly continuous in t on \mathbb{R} for each fixed $x \in X$;
- $C(t+s) + C(t-s) = 2C(t)C(s)$ for all $t, s \in \mathbb{R}$.

If $\{C(t) : t \in \mathbb{R}\}$ is strongly continuous cosine family in X , then $\{S(t) : t \in \mathbb{R}\}$, associated to the given strongly continuous cosine family, is defined by,

$$S(t)x = \sum_{s=0}^{t-1} C(s)x, \quad x \in X, t \in \mathbb{R} \quad (2.1)$$

We define closed operator $G : D(G) \subset X \rightarrow X$ It is denoted by $[D(G)]$, the space $[D(G)]$ endowed with the graph norm $\|\cdot\|_G$. The infinitesimal small generator $A : X \rightarrow X$ of a cosine family $\{C(t) : t \in \mathbb{R}\}$ is defined by




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STEADY-STATE HEAT CONDUCTION PROBLEM IN A THICK CIRCULAR PLATE AND ITS THERMAL STRESSES

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Abstract: The present paper deals with the determination of a quasi-static thermal stresses in a thick circular plate subjected to arbitrary temperature on the outer circular edge, with lower and upper face are at zero temperature. The governing heat conduction equation has been solved by using finite Fourier sine transform technique. The results are obtained in series form in terms of Bessels functions. The results for displacement and stresses have been computed numerically and illustrated graphically.

AMS Subject Classification: 35B07, 35G30, 35K05, 44A10

Key Words: quasi-static, thermal stresses, heat conduction problem, thick circular plate, steady-state

1. Introduction

Nowacki [1] has determined the steady-state thermal stresses in a circular plate subjected to an axisymmetric temperature distribution on the upper surface with zero temperature on the lower surface and with the circular edge thermally insulated. Roy Choudhary [2] has succeeded in determining the quasi-static thermal stresses in a thin circular plate subjected to a transient temperature along the circumference of a circle over the upper face with the lower face at zero temperature and a fixed circular edge thermally insulated. Okumura and Noda [3] presented an explicit solution composed of two thermoelastic potential functions in cylindrical coordinates for steady-state, axially

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MATHEMATICAL MODELING OF NON-HOMOGENEOUS STEADY STATE HEAT CONDUCTION PROBLEM IN A THIN CIRCULAR PLATE WITH UNIFORM HEAT SOURCE

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I. INTRODUCTION

During the second half of the 20th century, non-isothermal problems of the theory of elasticity became increasingly important. This is mainly due to their many applications in widely diverse fields. First, the high velocities of modern aircraft give rise to aerodynamic heating, which produces intense thermal stresses, reducing the strength of the aircraft structure. Second, in the nuclear field, the extremely high temperatures and temperature gradients originating inside nuclear reactors influence their design and operations [1].

Nowacki [2] determined steady-state thermal stresses in a circular plate subjected to an axisymmetric temperature distribution on the upper surface. The lower face is kept at zero temperature and the fixed circular edge is thermally insulated. The direct problem of normal deflection of an axisymmetrically heated circular plate in the case of fixed and simply supported edges have been considered by Boley and Weiner [3]. Further, Roy Choudhury [4] discussed the normal thermal deflection of a thin clamped circular plate due to ramp type heating of a concentric circular region of the upper face and lower face of the plate is kept at zero temperature, while the circular edge is thermally insulated. Ootao et al. [5] studied three-dimensional transient thermal stress analysis of a non-homogeneous hollow circular cylinder. Ishihara et al. [6] discussed the transient thermo elastoplastic bending problems of circular plate making use of the strain increment theorem. Some contribution of this theory are given in [7-18]

In this work, the two-dimensional steady-state heat conduction thermoelastic problem for a thin circular plate with the uniform heat source is considered. The fixed circular edge is a function of thickness, with the two ends maintained at zero temperature and with uniform heat source $q_0 (W.m^{-2})$. The finite Fourier transform technique is used. The analytical solution in the transform domain is obtained by using a direct approach. The temperature, displacement, and stress are obtained. Numerical computations are carried out and represented graphically. The results presented here will be useful in engineering problems, particularly in aerospace engineering for stations of a missile body not influenced by nose tapering. The missile shell material is assumed to have physical properties independent of temperature, so that the temperature $T(r, z)$ is a function of radius and thickness only.

II. FORMULATION OF THE PROBLEM

Consider a thin circular plate of radius r and thickness h occupying space $D: 0 \leq r \leq a, 0 \leq z \leq h$, under a steady-state temperature distribution, with uniform heat source $q_0 (W.m^{-2})$. The fixed circular edge ($r = a$) is kept at temperature $f(z)$, while the upper ($z = h$) and lower ($z = 0$) surfaces are maintained at zero temperature. Under these realistic prescribed conditions, the thermoelasticity of a thin circular plate with uniform heat source are required to be determined. The steady-state temperature of the plate $T(r, z)$ satisfies the following model:

$$\frac{\partial^2 T}{\partial r^2} + \frac{1}{r} \frac{\partial T}{\partial r} + \frac{\partial^2 T}{\partial z^2} + \frac{q_0}{k} = 0 \quad \text{in } 0 \leq r \leq a, 0 \leq z \leq h, \quad (1)$$

with the boundary conditions,

$$\frac{\partial T}{\partial r} = 0 \quad \text{at } r = 0 \quad (\text{symmetry}) \quad (2)$$

$$T = f(z) \quad \text{at } r = a \quad (3)$$

$$T = 0 \quad \text{at } z = 0 \quad \text{and } z = h \quad (4)$$

where k is the thermal conductivity of the material of the circular plate.

Following Roy Choudhary [4], we assume that a circular plate of small thickness h is in a plane state of stress. In fact "the smaller the thickness of the circular plate compared to its diameter, the nearer to a plane state of stress is the actual state". Then the displacements equations of thermoelasticity have the form

$$U_{i,j} + \left(\frac{1+\nu}{1-\nu} \right) e_j = 2 \left(\frac{1+\nu}{1-\nu} \right) \alpha_i T_j, \quad e = U_{k,i}; \quad k, i = 1, 2,$$



PRINCIPAL
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Axi-symmetric thermoelastic stress analysis of a thin circular plate due to heat generation

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Abstract: The aim of this work is to determine the temperature, displacement function, thermal stresses and thermal deflection of a thin circular plate defined as $0 \leq r \leq a$, $0 \leq z \leq h$ under an unsteady temperature field due to internal heat generation within it. Initially, the plate is kept at an arbitrary temperature $F(r, z)$. For times $t > 0$, heat is generated within the thin circular plate at a rate of $g(r, z, t) \text{ W. m}^{-3}$. The governing heat conduction equation has been solved by generalised finite Fourier transform and finite Hankel transform technique. The results are obtained in a series form in terms of Bessel's functions. The results for temperature, displacement function, thermal stresses and thermal deflection have been computed numerically and are illustrated graphically.

Keywords: Inverse thermoelastic problem; thermal deflection; circular plate; heat generation; thermal stresses; axi-symmetric.

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Biographical notes: Kishor R. Gaikwad is an Assistant Professor in Post Graduate Department of Mathematics, NES, Science College, Nanded. He has received his PhD (2012) in area Thermoelasticity from Dr. Babasaheb Ambedkar Marathwada University, Aurangabad, MS, India. He is actively involved in the field of Thermoelasticity particularly Boundary Value Problem of Heat Conduction and Fractional Differential Equations. The author has published more than 20 research publications in reputed national/international journals. The author has completed one minor research project under the scheme of University Grant Commission, New Delhi, India.

1 Introduction

Nowacki (1957) determined steady-state thermal stresses in a circular plate subjected to an axi-symmetric temperature distribution on the upper surface. The lower face is kept at zero temperature and the fixed circular edge is thermally insulated. The direct problem of normal

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MATHEMATICAL MODELING OF NON-HOMOGENEOUS STEADY STATE HEAT CONDUCTION PROBLEM IN A THIN CIRCULAR PLATE WITH UNIFORM HEAT SOURCE

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I. INTRODUCTION

During the second half of the 20th century, non-isothermal problems of the theory of elasticity became increasingly important. This is mainly due to their many applications in widely diverse fields. First, the high velocities of modern aircraft give rise to aerodynamic heating, which produces intense thermal stresses, reducing the strength of the aircraft structure. Second, in the nuclear field, the extremely high temperatures and temperature gradients originating inside nuclear reactors influence their design and operations [1].

Nowacki [2] determined steady-state thermal stresses in a circular plate subjected to an axisymmetric temperature distribution on the upper surface. The lower face is kept at zero temperature and the fixed circular edge is thermally insulated. The direct problem of normal deflection of an axisymmetrically heated circular plate in the case of fixed and simply supported edges have been considered by Boley and Weiner [3]. Further, Roy Choudhury [4] discussed the normal thermal deflection of a thin clamped circular plate due to ramp type heating of a concentric circular region of the upper face and lower face of the plate is kept at zero temperature, while the circular edge is thermally insulated. Ootao et al. [5] studied three-dimensional transient thermal stress analysis of a non-homogeneous hollow circular cylinder. Ishihara et al. [6] discussed the transient thermo elastoplastic bending problems of circular plate making use of the strain increment theorem. Some contribution of this theory are given in [7-18]

In this work, the two-dimensional steady-state heat conduction thermoelastic problem for a thin circular plate with the uniform heat source is considered. The fixed circular edge is a function of thickness, with the two ends maintained at zero temperature and with uniform heat source $q_0 (W.m^{-2})$. The finite Fourier transform technique is used. The analytical solution in the transform domain is obtained by using a direct approach. The temperature, displacement, and stress are obtained. Numerical computations are carried out and represented graphically. The results presented here will be useful in engineering problems, particularly in aerospace engineering for stations of a missile body not influenced by nose tapering. The missile skin material is assumed to have physical properties independent of temperature, so that the temperature $T(r, z)$ is a function of radius and thickness only.

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$$\frac{\partial^2 T}{\partial r^2} + \frac{1}{r} \frac{\partial T}{\partial r} + \frac{\partial^2 T}{\partial z^2} + \frac{q_0}{k} = 0 \text{ in } 0 \leq r \leq a, 0 \leq z \leq h \tag{1}$$

with the boundary conditions,

$$\frac{\partial T}{\partial r} = 0 \text{ at } r = 0 \text{ (symmetry)} \tag{2}$$

$$T = f(z) \text{ at } r = a \tag{3}$$

$$T = 0 \text{ at } z = 0 \text{ and } z = h \tag{4}$$

where k is the thermal conductivity of the material of the circular plate.

Following Roy Choudhary [4], we assume that a circular plate of small thickness h is in a plane state of stress. In fact "the smaller the thickness of the circular plate compared to its diameter, the nearer to a plane state of stress is the actual state". Then the displacements equations of thermoelasticity have the form

$$U_{i,j} + \left(\frac{1+\nu}{1-\nu}\right)e_j = 2\left(\frac{1+\nu}{1-\nu}\right)a_i T_j$$

$$e = U_{k,i}; \quad k, i = 1, 2$$



PRINCIPAL
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TRANSIENT THERMOELASTIC STRESS ANALYSIS OF A THIN CIRCULAR PLATE DUE TO UNIFORM INTERNAL HEAT GENERATION

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ABSTRACT. The present work aims to analyze the transient thermoelastic stress analysis of a thin circular plate with uniform internal heat generation. Initially, the plate is characterized by a parabolic temperature distribution along the x -direction given by $T = T_0(r, x)$ and perfectly insulated at the ends $x = 0$ and $x = h$. For times $t > 0$, the surface $r = a$ is subjected to convection heat transfer with convection coefficient h_c and fluid temperature T_{∞} . The integral transform method used to obtain the analytical solution for temperature, displacement, and thermal stresses. The associated thermoelastic field is analyzed by making use of the temperature and thermoelastic displacement potential function. Numerical results are carried out with the help of computational software PTC Mathcad Prime-3.1 and shown in figures.

1. INTRODUCTION

Nowacki [1] has studied the steady-state thermoelastic problem of a thick circular plate subject to axisymmetric temperature distribution on the upper surface with the lower surface is kept at zero temperatures and the fixed circular edge is thermally insulated. The direct thermoelastic problem of normal deflection due to axisymmetric heat supply on a circular plate in the case of fixed and simply supported edges have been considered in [2]. The approximate analytical and the exact solutions of the one-dimensional transient thermoelastic problems of heat flux and temperature determination on the surface of an isotropic infinite slab presented in [3]. Theoretical analysis of a three-dimensional transient thermoelastic problem of a non-homogeneous hollow circular cylinder due to a moving heat source in the axial direction from the inner and outer surfaces were presented in [4]. The transient thermoelastoplastic bending problems making use of the strain increment theorem and thermoelastic deformation of the circular plate due to a partially distributed heat supply was studied in [5]. The transient heat conduction and analysis of thermal stresses in a thin circular plate subjected to some different types of boundary conditions were presented in [6]. Some contributions of this theory are given

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Analysis of transient thermoelastic temperature distribution of a thin circular plate and its thermal deflection under uniform heat generation

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ABSTRACT

Analysis of transient thermoelastic temperature distribution of a thin circular plate and its thermal deflection under uniform internal heat generation is investigated. The upper and lower surfaces are thermally insulated, while the perimeteric surface is subjected to convection heat transfer with convection coefficient h_c and fluid temperature T_∞ , while the plate is also subjected to uniform internal energy generation g_0 ($W.m^{-3}$). The integral transform method is used to obtain the analytical solution for the temperature field and thermal deflection. As a special case, the mathematical model is prepared for copper material, and temperature distribution is analyzed for two different initial conditions. The results for temperature changes and the thermal deflection are computed numerically and illustrated graphically.

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35K05; 44A10

1. Introduction

The steady-state thermoelastic problem of a thick circular plate subject to axisymmetric temperature distribution on the upper surface with the lower surface is kept at zero temperature and the fixed circular edge is thermally insulated was studied in [1]. The direct thermoelastic problem of normal deflection due to axisymmetric heat supply on circular plate in the case of fixed and simply supported edges was considered in [2]. The approximate analytical and the exact solutions of the one-dimensional transient thermoelastic problems of heat flux and temperature determination on the surface of an isotropic infinite slab was presented in [3]. Theoretical analysis of a three-dimensional transient thermoelastic problem of a nonhomogeneous hollow circular cylinder due to a moving heat source in the axial direction from the inner and outer surfaces were obtained in [4]. The transient thermoelasto-plastic bending problems making use of the strain increment theorem and thermoelastic deformation of the circular plate due to a partially distributed heat supply was studied in [5]. Thermal deflection of a circular plate due to heating of a concentric circular region was analyzed in [6]. Three-dimensional thermomechanical deformations of a simply supported functionally graded rectangular plate subjected to time-dependent thermal loads on its top and/or bottom surfaces have been investigated in [7]. The inverse problem of thermoelasticity and determining unknown temperature gradient, temperature distribution, and thermal deflection on the curved surface of the plate by employing integral transform has been discussed in [8]. An

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TIME FRACTIONAL 2D THERMOELASTIC PROBLEM OF THIN HOLLOW CIRCULAR DISK AND IT'S ASSOCIATED THERMAL STRESSES

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Abstract

This paper is dealing with the time-fractional two-dimensional thermoelastic problem for a thin hollow circular disk and its associated thermal stresses. The zero initial conditions are assumed, with all four boundary conditions being nonhomogeneous. The governing heat conduction equation solved using the integral transform technique including Mittag-Leffler functions. The results have been computed numerically and illustrated graphically with the help of Mathcad software.

1 INTRODUCTION

Biot [1] introduced the generalization of the classical coupled thermoelasticity theory. Loed and Shulman [14] introduced the generalized dynamical theory of thermoelasticity with one relaxation time, for the isotropic body. Ishihara et al. [3] discussed the transient thermo elastoplastic bending problems of circular plate making use of the strain increment theorem. Kar et al. [13] discussed the generalized thermoelastic problem of a hollow sphere under thermal shock. Some contributions of this theory is given in [4-11]. Recently, many fractional-order thermoelastic problems have been discussed in [2, 12, 16, 18-20, 22, 23, 25-28].

¹Keywords: Circular Disk; Thermal stresses; Caputo Fractional Derivative; Integral transform
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GENERALIZED THEORY OF MAGNETO-THERMO-VISCOELASTIC
SPHERICAL CAVITY PROBLEM UNDER FRACTIONAL ORDER
DERIVATIVE: STATE SPACE APPROACHS. G. KHAWALE AND K. R. GAIKWAD¹

ABSTRACT. This paper is dealing the modified Ohm's law with the temperature gradient of generalized theory of magneto-thermo-viscoelastic for a thermally, isotropic and electrically infinite material with a spherical region using fractional order derivative. The general solution obtained from Laplace transform, numerical Laplace inversion and state space approach. The temperature, displacement and stresses are obtained and represented graphically with the help of matlab software.

1. INTRODUCTION

Sherief et al. in [1] presented the new theory of coupled and generalized thermoelasticity using time using the method of fractional calculus. Povstenko in [2,3] solved some thermoelastic problem based on the 1D and 2D thermoelastic problem with a time fractional derivative. Gaikwad in [4] analysed the thermoelasticity of thin disk under partially heat supply. Many researchers in [5-9] studied the various problems on thermoelasticity and fractional order thermoelasticity.

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Key words and phrases. Fractional order, magneto-thermo-viscoelasticity, spherical cavity, modified Ohm's law.

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TIME FRACTIONAL THERMOELASTIC STRESS ANALYSIS OF A THIN RECTANGULAR PLATE

KISHOR B. GAIKWAD¹*, Y. U. NANER², S. G. KHAVALE³

ABSTRACT. In this study, the temperature, displacement and thermal stresses in a thin rectangular plate are calculated by using fractional order theory of thermoelasticity. Initially the plate is at zero temperature, while the boundary at $y = 0$ is kept at temperature $\Phi(x, t)$ and the remaining boundaries are kept at zero temperature. The problem is formulated in the context of fractional order thermoelasticity theory. The Double integral transform, Laplace transform and inverse of Laplace transform are used to obtain results. The results are obtained in the form of Mittag-Leffler function. The results for temperature, displacement and thermal stresses have been computed numerically and illustrated graphically for different values of fractional order parameter.

Keywords: Fractional order, Heat conduction problem, Thermal stresses, Rectangular plate.

1. INTRODUCTION

Tanigawa et al. [1] have studied the transient thermoelastoplastic bending problem of an infinite plane and developed the analysis for the temperature field using methods of Fourier Cosine and Laplace Transform, the theoretical solution is obtained. Tanigawa et al. [2] discussed the transient thermoelastic problem of a rectangular plate due to a nonuniform heat supply is treated theoretically and fracture behaviors of the plate with a crack are examined for compressive stress field. Chen [3] solved the linear problem of transient temperature and thermal stresses in a thin finite rectangular plate subject to heat losses due to nonuniform heat transfer coefficients on the upper and lower surfaces of the plate. Vihak et al. [4] proposed a new method of solving a plane quasi-static thermoelasticity problem in terms of stresses for a rectangular domain. Pachinger et al. [5] have studied thermally induced bending problem of a thin rectangular plates with one clamped and three simply supported edges for the case of a spacewise constant thermal moment. Adam et al. [6] developed the response of a rectangular, simply supported, symmetrically laminated, cross-ply composite plate subject to a thermal shock. Ootao et al. [7] have studied theoretical analysis of

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1



GREEN'S FUNCTION APPROACH TO THERMAL DEFLECTION OF A THIN HOLLOW CIRCULAR DISK UNDER AXISYMMETRIC HEAT SOURCE

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ABSTRACT. A Green's function approach is adopted to solve the two-dimensional thermoelastic problem of a thin hollow circular disk. Initially, the disk is kept at temperature $T_0(x, y)$. For times $t > 0$, the inner and outer circular edges are thermally insulated and the upper and lower surfaces of the disk are subjected to convection heat transfer with convection coefficient h , and fluid temperature T_∞ , while the disk is also subjected to the axisymmetric heat source. As a special case, different metallic disks have been considered. The results for temperature and thermal deflection has been computed numerically and illustrated graphically.

1. INTRODUCTION

Roy Choudhury [1] discussed the normal deflection of a thin clamped circular plate due to ramp-type heating of a concentric circular region of the upper face and the lower face of the plate kept at zero temperature while the circular edge is thermally insulated. Grysa and Kozłowski [2] investigated an inverse one-dimensional transient thermoelastic problem and obtained the temperature and heat flux on the surface of an isotropic infinite slab. Ootao et al. [3, 4] studied the theoretical analysis of a three-dimensional transient thermal stress problem for a nonhomogeneous/functionally graded hollow circular cylinder due to a moving heat source in the axial direction from the inner and outer surfaces. Tariqawa et al. [5] discussed the theoretical analysis of thermoelastoplastic deformation of a circular plate due to a partially distributed heat supply. Noda et al. [6] discussed the transient thermoelastoplastic bending problems, making use of the strain increment theorem, and determined the temperature field and the thermoelastic deformation for the heating and cooling processes in a thin circular plate subjected to a partially distributed and axisymmetric heat supply on the upper surface.

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Key words and phrases. Green's Function, Hollow Circular Disk, Axisymmetric Heat Source, Thermal Deflection.

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GREEN'S FUNCTION APPROACH TO TRANSIENT THERMOELASTIC DEFORMATION OF A THIN HOLLOW CIRCULAR DISK UNDER AXISYMMETRIC HEAT SOURCE

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Abstract

A Green's function approach is adopted to solve the two-dimensional transient thermoelastic deformation of a thin hollow circular disk. Initially, the disk is kept at temperature $T_0(r, z)$. For times $t > 0$, the inner and outer circular edges are thermally insulated and the upper and lower surfaces of the disk are subjected to convection heat transfer with convection coefficient h_f and fluid temperature T_∞ , while the disk is also subjected to the axisymmetric heat source.

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Keywords and phrases: Green's function, hollow circular disk, axisymmetric heat source, thermal stresses

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Fractional Order Thermoelastic Problem of Thin Hollow Circular Disk and its Thermal Stresses Under Axi-Symmetric Heat Supply

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ABSTRACT:

In this paper, we solve a fractional order thermoelastic problem of a thin hollow circular disk under axi-symmetric heat supply is discussed and analysed the temperature, displacement and stress field due to the internal heat source. Initially, the disk is kept at zero temperature. For $t > 0$ the parametric surfaces are thermally insulated and axi-symmetric heat supply on the thickness of the disk. The governing heat conduction equation has been solved by integral transform technique including Mittag-Leffler function. The results have been computed numerically and illustrated graphically.

Keywords: Fractional Order, Mittag-Leffler function, Axi-symmetric heat supply, Hollow circular disk.

INTRODUCTION

Biot [1] introduced the generalization of the classical coupled thermoelasticity theory. Lord and Shulman [2] introduced the generalized dynamical theory of thermoelasticity with one relaxation time, for the isotropic body. Ishihara et al. [3] discussed the transient thermo elastoplastic bending problems of circular plate making use of the strain increment theorem. Some contribution of thermoelastic and fractional order thermoelastic problems have been discussed [4-23]. This study aims for estimating the temperature distribution, displacement, as well as stress for a thin hollow circular disk under the axisymmetric heat temperature distribution. A direct method is used to get a solution and the Laplace transform technique is used. Mathematical models for copper material are designed as a particular instance. Numerical results are computed with help of Mathcad software and represented graphically as well as the fractional order parameter effect has been explained.




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2D PROBLEM FOR A SPHERE IN THE FRACTIONAL ORDER THEORY THERMOELASTICITY TO AXISYMMETRIC TEMPERATURE DISTRIBUTION

Satish G. Khavale and Kishor R. Galkwad¹

ABSTRACT. In the present article, we implement the fractional thermoelasticity theory to a 2D issue for a sphere whose surface is free from traction, subject to a provided axisymmetric temperature distribution of heat. The medium is supposed to be quiescent initially. A direct method is used to get a solution and the Laplace transform technique is used. Mathematical models for copper material are designed as a particular instance. Numerical results are computed with help of Mathcad software and graphically represented and the fractional-order parameter effect has been explained.

Nomenclature:

t	Time
T	Absolute temperature
ρ	Density
λ, μ	Lame's constants
e	Cubical dilation = $\text{div } \mathbf{u}$
γ	$= (3\lambda + 2\mu)\alpha_T$
σ_{ij}	Stress tensor components

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Key words and phrases. 2D sphere, Fractional order, Axisymmetric temperature, Thermoelasticity.

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ANALYSIS OF NON-INTEGER ORDER THERMOELASTIC TEMPERATURE DISTRIBUTION AND THERMAL DEFLECTION OF THIN HOLLOW CIRCULAR DISK UNDER THE AXI-SYMMETRIC HEAT SUPPLY

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ABSTRACT. Analysis of non-integer order thermoelastic temperature distribution and its thermal deflection of thin hollow circular disk under the axi-symmetric heat supply is investigated. Initially, the disk is kept at zero temperature. For $t > 0$ the parametric surfaces are thermally insulated and axi-symmetric heat supply on the thickness of the disk. The governing heat conduction equation has been solved by integral transform technique, including Mittag-Leffler function. The results have been computed numerically and illustrated graphically with the help of PTC-Mathcad.

1. INTRODUCTION

Biot [1] introduced the generalization of the classical coupled thermoelasticity theory. Lord and Shulman [2] introduced the generalized dynamical theory of thermoelasticity with one relaxation time, for the isotropic body. Ishihara et al. [3] discussed the transient thermo-elastic bending problems of circular plate making use of the strain increment theorem. Kar et al. [4] considered the generalized thermoelastic problem of a hollow sphere under thermal shock. Gaikwad and Ghadle [5] discussed the steady-state thermoelastic problem for a finite length hollow circular cylinder. Some contribution of this theory are given [6, 7, 8, 9, 12, 13]. The nonhomogeneous heat conduction problem of a thin hollow circular disk and its thermal deflection under heat generation was solved in [10].

The thermoelastic analysis and its deformation of a thin hollow circular disk subject to a partially distributed and axisymmetric heat supply on the upper surface studied in [11]. Studied the time-fractional heat conduction problem in a thin hollow circular disk and its thermal deflection in [14]. Analyzed the transient thermoelastic temperature distribution of a thin circular plate and its thermal deflection under uniform heat generation in [15]. discussed the

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Key words and phrases. Non-integer Order, Mittag-Leffler function, Thermal Deflection, Axi-symmetric heat supply, Parametric surface.

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Fractional Order Transient Thermoelastic Stress Analysis of a Thin Circular Sector Disk

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Abstract

Analysis of transient thermoelastic stress distribution of a thin circular sector disk with a time-fractional derivative of order α is proposed. The Neumann types of boundary conditions are used and the integral transform method and Caputo fractional derivative are used to obtain the analytical solutions of the temperature, displacement, and stresses. Numerical values of temperature, displacement, and stresses are computed for an Aluminum (pure) material and presented graphically with help of Mathcad software.

Keywords: Circular sector disk; thermal stresses; fractional order derivative; heat conduction.

1. Introduction

Lord et al. [1] introduced the generalized thermoelastic theory of dynamical system with one relaxation time, for the isotropic body. Green et al. [2] proposed the behavior of thermoelastic material without energy dissipation with linear and nonlinear theories. Ootao et al. [3] solved the 3D problem for an non-homogeneous hollow circular cylinder with moving heat sources in the axial direction and its transient thermal stresses. Ishihara et al. [4] presented the theoretical approach of thermoelastic deformation for a circular plate with a partially distributed heat supply. Sherief et al. [5] studied the two-dimensional problem for a half-space whose surface is traction-free and subjected to the effects of heat sources is considered within the context of the theory of thermoelasticity with two relaxation times. Podlubny [6] presented the geometrical and physical interpretation of fractional integration and fractional differentiation. Povstenko [7] proposed the stresses corresponding to the fundamental solutions of a Cauchy problem for the fractional heat conduction equation in one-dimensional and two dimensional cases using the Caputo fractional derivative. Sherief et al. [8] discussed the problem of a thermoelastic half-space with a permeating substance in contact with the bounding plane in the context of the theory of generalized thermoelastic diffusion with one relaxation time. Povstenko [9] discussed the heat conduction with time and space fractional derivatives and on the theory of thermal stresses based on this equation. Sherief et al. [10] derived the new theory of thermoelasticity using the methodology of fractional calculus and the theories of coupled thermoelasticity and of generalized thermoelasticity with one relaxation time discussed.

Gaikwad et al. [11] studied the quasi-static thermoelastic mathematical model for infinitely long circular cylinder by using the integral transform technique. El-Karamany et al. [12] introduced the two

anisotropic elastic solids and the constitutive equations for thermoelasticity theory are obtained, uniqueness and reciprocal theorems are proved and the convolution variational principle is established and used to prove a uniqueness theorem with no restriction on the elasticity or thermal conductivity tensors except for symmetry conditions. Sur et al. [13] proposed a new theory of two-temperature generalized thermoelasticity is constructed in the context of a new consideration of heat conduction with fractional orders. Gaikwad et al. [14] studied the non-homogeneous heat conduction problem and its thermal deflection due to internal heat generation in a thin hollow circular disk. Gaikwad [15] analyzed the thermoelastic deformation of a thin hollow circular disk due to a partially distributed heat supply. Sur et al. [16] proposed a new mathematical model of thermoelasticity theory in the context of a new consideration of heat conduction with fractional-order theory. A functionally graded isotropic unbounded medium is considered subjected to a periodically varying heat source in the context of space-time non-local generalization of three-phase-lag thermoelastic model and Green-Naghdi models. Raslan [17] studied the fractional order theory of thermoelasticity to a 1D problem of an infinitely long cylindrical cavity. Raslan [18] introduced the fractional-order theory of thermoelasticity to the two-dimensional problem of a thick plate whose lower and upper surfaces are traction-free and subjected to the given axi-symmetric temperature distribution. Gaikwad [19] studied the mathematical modeling of thermoelastic problem in a circular sector disk subject to heat generation. Gaikwad [20] proposed the two-dimensional steady-state temperature distribution of a thin circular plate due to uniform internal energy generation. Gaikwad [21] discussed the axi-symmetric thermoelastic stress analysis of a thin circular plate due to heat generation. Gaikwad [22] studied the time-fractional heat conduction problem in a thin hollow circular disk and its



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Two-Dimensional Generalized Magneto-Thermo-Viscoelasticity Problem for a Spherical Cavity with One Relaxation Time Using Fractional Derivative

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Abstract:

The present paper is aimed to studying the two-dimensional generalised magneto-thermo-viscoelasticity problem for a spherical cavity with one relaxation time using fractional derivative. The formulation is applied to generalised thermoelasticity based on the theory of generalised thermoelastic diffusion with one relaxation time. The spherical cavity of the solid surface is assumed to be traction free and subjected to both heating and an external magnetic field. The Laplace transform technique is used to obtain the general solution. The inverse Laplace transform is carried out using a numerical inversion method based. The temperature, displacement, and stresses are obtained and represented graphically with the help of Mathematic software.

Keywords: Fractional order; magneto-thermo-viscoelasticity; spherical cavity; electromagnetic field.

1. Introduction

The classical theory of thermoelasticity has been generalised and modified into various thermoelastic models that run under the label of hyperbolic thermoelasticity. The notation hyperbolic reflects the fact that thermal waves are modelled, avoiding the physical paradox of the infinite propagation speed of the classical model. At present, there are several theories of hyperbolic thermoelasticity.

Biot [1] introduced the theory of coupled thermoelasticity, which predicts infinite speeds of wave propagation, which is physically unacceptable. Lord and Shulman [2] introduced the generalized dynamical theory of thermoelasticity with one relaxation time, for the isotropic body. Caputo [3] proposed viscoelastic energy dissipation mechanism based on a memory mechanism with two degrees of freedom for the problem. Ezzat [4] discussed the generalised magneto-thermoelastic waves by thermal shock in half-space. Ezzat [5] used the fractional order derivative to investigate magneto-thermoelasticity with thermoelectric properties. Roychoudhuri et al. [6, 7] investigated magneto-thermoelastic interactions in a viscoelastic cylinder of temperature rate dependent material subjected to periodic loading, as well as the effect of rotation and relaxation times in generalised thermoviscoelasticity. Sherief et al. [8] proposed the new theory of coupled thermoelasticity and generalised thermoelasticity with one relaxation time using the method of fractional calculus. Povstenko [9] solved some thermoelastic problems based on the heat conduction equation in one dimensional and two dimensional domains with a time fractional derivative and associated thermal stresses. Deswal and Kalkal [10] introduced the effects of viscosity and diffusion on thermoelastic interactions in thermally, isotropic and electrically conducting half-space solids whose surfaces are subjected to thermal and mechanical loads.

Zenkour et al. [11] studied the generalised thermodiffusion of an unbounded body for a spherical cavity subjected to periodic loading. Gaikwad et al. [12] studied the quasi-static thermoelastic mathematical model for an infinitely long circular cylinder by using the integral transform technique. Gaikwad [13] analysed the thermoelastic deformation of a thin hollow circular disk due to a partially distributed heat supply. Gaikwad et al. [14] studied the non-homogeneous heat conduction problem and its thermal deflection due to internal heat generation in a thin hollow circular disk. Gaikwad [15] analysed the thermoelastic deformation of a thin hollow circular disk due to partially distributed heat supply. H. Sherief and A. M. Abd El-Latif [16] discussed the application of fractional order theory of thermoelasticity problem for a half-space. Raslan [17] solved one dimensional problem of fractional order theory of thermoelasticity of an infinitely long cylindrical cavity using integral transform technique. Kalkal and Deswal [18] investigated the effects of fractional order parameter, viscosity, magnetic field, and diffusion on thermoelastic interaction in an infinite body with a mechanical load on its surface. Hussain [19] solved the fractional order thermoelastic problem for an infinitely long solid circular cylinder. Raslan [20] introduced the fractional-order theory of thermoelasticity to the two-dimensional problem of a thick plate whose lower and upper surfaces are traction-free and subjected to the given axis-symmetric temperature distribution. Gaikwad [21] proposed the two-dimensional study-state temperature distribution of a thin circular plate due to uniform internal energy generation.

Tripathi et al. [22] analyzed the fractional order thermoelastic problem for a thick circular plate with finite wave speeds. Gaikwad [23] discussed the axis-symmetric thermoelastic stress analysis of a thin circular plate due to heat generation. Gaikwad [24] studied the time-fractional

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Transient thermoelastic bending analysis of a rectangular plate with a simply supported edge under heat source: Green's function approach

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(Communicated by Saman Babae-Kafaki)

Abstract

The aim of the current research is to analyze the transient thermoelastic bending analysis of a rectangular plate with a simply supported edge under the heat source. Initially, the plate is kept at a constant temperature. For $t > 0$, the heat is produced in the plate at the rate $q(W.m^{-3})$ and the surfaces at $x = 0, a$ and $y = 0, b$ are kept at zero temperature, while the surfaces $z = 0, c$ are subjected to heat convection. Using Green's function approach and integral transform technique, the analytical solution of the rectangular plate with the simply supported edge is derived. As a prominent finding from this investigation, it can be deduced that the accuracy, reliability, and simplicity of these methods are excellent. Accurate bending solutions to title problems are then obtained using the transform technique. The approach used in this paper is more reasonable than conventional methods. Numerical results are presented to demonstrate the validity and efficiency of the approach as compared with those reported in other literature. The outcomes demonstrate that the temperature profile and the thermal deflection are maximum at the middle part of the plate, due to the heat source located in the middle, however, the direction of heat flow and the body deformation is the same.

Keywords: Green's Function, Rectangular plate, Heat Source, Thermal Bending, Thermal Stresses
2020 MSC: 35B07, 35G30, 35K05, 44A10

1 Introduction

The thin rectangular plate is an important structural component that is widely applied in various modern engineering fields, such as aircraft wings, rigid pavements, houses, and bridge decks. Bending analysis of a rectangular plate with mixed boundary conditions has been studied for many years, but most existing methods are appropriate only for particular boundary conditions. This study has changed miraculous attention due to the wide application of the rectangular plate.

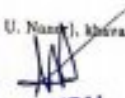
Manthana et al. [1, 2] studied the temperature distribution, bending moments and thermal stresses in a functionally graded rectangular plate under unsteady temperature distribution using integral transform method. Manthana et al. [3]

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Two-Dimensional Generalized Magneto-Thermo-Viscoelasticity Problem for a Spherical Cavity with One Relaxation Time Using Fractional Derivative

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Keywords: Fractional order; magneto-thermo-viscoelasticity; spherical cavity; electromagnetic field.

1. Introduction

The classical theory of thermoelasticity has been generalised and modified into various thermoelastic models that run under the label of hyperbolic thermoelasticity. The notation hyperbolic reflects the fact that thermal waves are modelled, avoiding the physical paradox of the infinite propagation speed of the classical model. At present, there are several theories of hyperbolic thermoelasticity.

Biot [1] introduced the theory of coupled thermoelasticity, which predicts infinite speeds of wave propagation, which is physically unacceptable. Lord and Shulman [2] introduced the generalised dynamical theory of thermoelasticity with one relaxation time, for the isotropic body. Caputo [3] proposed viscoelastic energy dissipation mechanism based on a memory mechanism with two degrees of freedom for the problem. Ezzat [4] discussed the generalised magneto-thermoelastic waves by thermal shock in half-space. Ezzat [5] used the fractional order derivative to investigate magneto-thermoelasticity with thermoelectric properties. Roychoudhuri et al. [6, 7] investigated magneto-thermoelastic interactions in a viscoelastic cylinder of temperature rate dependent material subjected to periodic loading, as well as the effect of rotation and relaxation times in generalised thermoviscoelasticity. Sherief et al. [8] proposed the new theory of coupled thermoelasticity and generalised thermoelasticity with one relaxation time using the method of fractional calculus. Povstenko [9] solved some thermoelastic problems based on the heat conduction equation in one dimensional and two dimensional domains with a time fractional derivative and associated thermal stresses. Deswal and Kalkal [10] introduced the effects of viscosity and diffusion on thermoelastic interaction in half-space thermally, isotropic and electrically conducting solids whose surfaces are subjected to thermal and mechanical loads.

Zenkour et al. [11] studied the generalised thermodiffusion of an unbounded body for a spherical cavity subjected to periodic loading. Gaikwad et al. [12] studied the quasi-static thermoelastic mathematical model for an infinitely long circular cylinder by using the integral transform technique. Gaikwad [13] analysed the thermoelastic deformation of a thin hollow circular disk due to a partially distributed heat supply. Gaikwad et al. [14] studied the non-homogeneous heat conduction problem and its thermal deflection due to internal heat generation in a thin hollow circular disk. Gaikwad [15] analysed the thermoelastic deformation of a thin hollow circular disk due to partially distributed heat supply. H. Sherief and A. M. Abd El-Latif [16] discussed the application of fractional order theory of thermoelasticity problem for a half-space. Raslan [17] solved one dimensional problem of fractional order theory of thermoelasticity of an infinitely long cylindrical cavity using integral transform technique. Kalkal and Deswal [18] investigated the effects of fractional order parameter, viscosity, magnetic field, and diffusion on thermoelastic interaction in an infinite body with a mechanical load on its surface. Hussain [19] solved the fractional order thermoelastic problem for an infinitely long solid circular cylinder. Raslan [20] introduced the fractional-order theory of thermoelasticity to the two-dimensional problem of a thick plate whose lower and upper surfaces are traction-free and subjected to the given axis-symmetric temperature distribution. Gaikwad [21] proposed the two-dimensional steady-state temperature distribution of a thin circular plate due to uniform internal energy generation.

Tripathi et al. [22] analyzed the fractional order thermoelastic problem for a thick circular plate with finite wave speeds. Gaikwad [23] discussed the axis-symmetric thermoelastic stress analysis of a thick circular plate due to heat generation. Gaikwad [24] studied the time-fractional

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Fractional Thermoelasticity: A Review

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Abstract

In the present article, a review of fractional order thermoelastic models that look very promising for future development of fractional order theories. We have presented a short introduction to fractional calculus as a theory of integration and differentiation of non-integer order. The recently developed fractional order thermoelastic models are described with their basic mathematical formulation and characteristic features of these models are illustrated. Also, the paper concludes with a discussion on the future potential of the use of fractional order theory of thermoelasticity for the analysis of thermodynamical interactions in solid.

Keywords: Thermoelasticity, Fractional order derivative, Elasticity, Fractional calculus.
2020 MSC: 35B07, 35G30, 35K05, 44A10, 26A33, 35A22, 74S40)

1 Introduction

The thermoelasticity theory is a combination of elasticity and heat conduction theories. It is related to the impact of heat on the deformation of an elastic medium and the inverse impact of the deformation on the thermal condition of the considered medium. Thermal stress is produced when the time rate of variation of a heat source in a medium or the time rate of variation of thermal boundary conditions on a medium is compared with the structural oscillation characteristics. In this condition, the solutions to the problem for the stress and temperature should be derived via the thermoelasticity coupled equations. The classical uncoupled theory of thermoelasticity predicts two phenomena not compatible with physical observations. First, the equation of heat conduction of this theory does not contain any elastic terms; second, the heat equation is of a parabolic type, predicting infinite speeds of propagation for heat waves.

In 1956, Biot M. A. [1] formulated the theory of coupled thermoelasticity to eliminate the paradox inherent in the classical uncoupled theory that elastic changes have no effect on the temperature. The heat equations for both theories are of the diffusion type predicting infinite speeds of propagation for heat waves contrary to physical observations. In 1967, Lord and Shulman [2] introduced the theory of generalized thermoelasticity with one relaxation time for the special case of an isotropic body. This theory was extended by Dhalwal and Sherief [3] to include the anisotropic case. In this theory a modified law of heat conduction including both the heat flux and its time derivative replaces the conventional Fourier's law. The heat equation associated with this theory is hyperbolic and hence eliminates the paradox of infinite speeds of propagation inherent in both the uncoupled and the coupled theories of thermoelasticity. The second generalization to the coupled theory of elasticity is known as the theory of thermoelasticity with two relaxation times or the theory of temperature rate dependent thermoelasticity.

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PRINCIPAL
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Fractional ordered thermoelastic stress analysis of a thin circular plate under axi-symmetric heat supply

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(Communicated by Abdolrahman Raziqi)

Abstract

The main objective of the current study is to investigate the fractional ordered thermoelastic stress analysis of a thin circular plate under axi-symmetric heat supply. Initially, the plate is characterized by the initial temperature $T_0(r, z)$. The boundary value problem is formulated with a circular plate model where the perimeter edge is clamped and convection, and the upper and lower surfaces are subjected to heat convection with convection coefficient h_1 and fluid temperature T_∞ . The variable separable technique and Green's function approach scheme have been employed to solve the heat conduction equation. The impacts of the fractional ordered derivative of some other parameters on temperature, deflection, and stress profiles will be analyzed in detail. For instance, the results indicate that the temperature and thermal deflection are directly proportional to the fractional order parameter α . Also, the parameter α represents the weak, normal, and strong conductivity, within the range of $0 < \alpha < 1$, $\alpha = 1$ and $1 < \alpha < 2$ respectively.

Keywords: Caputo fractional derivative, Green's function, Axi-symmetric heat source, Thin circular plate, Mittag-Leffler functions

2020 MSC: 35B07, 35G30, 35K05, 44A10

1 Introduction

Povstenko [26, 27] solved some thermoelastic problems based on the equation of heat conduction in 1D as well as 2D with a time-fractional derivative and associated thermal stresses. In four distinct thermoelasticity theories, Roushan Kumar and Mukhopadhyay [23] explored general thermoelastic interactions in unbounded elastic media and spherical cavities. Avijit and Kanoria [16] presented thermoelasticity theories for a hollow sphere with a thermal shock problem. In the fractional calculus technique, Sherief et. al. [34] introduced the novel coupling between thermoelasticity and widespread thermoelasticity with one relaxation cycle. Sur and Kanoria [36] developed the new theory of thermoelastic distribution of two temperature with new heat conduction equation with fractional order. Youssef [39] solved the generalized thermoelasticity theory of a half-space filled with an elastic material, which has constant elastic parameters in the context of the fractional order derivative. Gaikwad and Ghadle [8] presented the thermoelastic problem for the thick circular plate subjected to an interior heat flux under an unsteady-state, the

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FRACTIONAL ORDER THERMOELASTIC PROBLEM FOR A THIN CIRCULAR PLATE WITH UNIFORM INTERNAL HEAT GENERATION

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Keywords and phrases: fluid temperature, fractional derivative, thermoelasticity, heat generation, circular plate.

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A study of the 3-phase lag model to a two-dimensional isotropic micro-polar thermoelastic medium with memory-dependent properties

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ABSTRACT

This article enlightens the two-dimensional (2D) isotropic micro-polar thermoelastic problem of the three-phase-lag (3PHL) model and heat conduction equation is formulated in the context of memory-dependent derivative (MDD). The equations are converted into the domain of the Laplace transform vector matrix differential equation form and solved by using the eigenvalue technique. To obtain an analytical solution of displacement, temperature, and stress components Silicon material properties are used. Inversion of the Laplace transform with Fourier series expansion technique is used to obtain the numerical solution. For obtaining graphical results Mathematica software is used. For the purpose of exhibiting the beauty of MDD in the present model comparisons are made between the time delay parameters and kernel functions (constant, linear, and non-linear kernels), respectively, over the micro-polar panel. The results obtained have a valuable impact on structural analysis, especially in the design of rotating machinery structures using accurate material properties.

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KEYWORDS

Memory-dependent derivative; micro-polar; thermoelasticity; three-phase-lag model; two-dimensional

1. Introduction

Biot [1] described two phenomena of classical uncoupled thermoelasticity related to parabolic and hyperbolic heat conduction equations. However, this theory has the disadvantage of having an infinite speed of wave propagation. Lord Shulman (LS) [2], Green Lindsay (GL) [3], and Green-Naghdi (GN) [4] later established the non-classical heat conduction model based on a finite speed of wave propagation. Tzou [5] formulated the heat conduction law for the two-phase-lag (2PHL) model under the time and space domains. Chaudhari [6] introduced the three-phase-lag (3PHL) model for coupled thermoelasticity with the modified Fourier law of heat conduction, which is an extension of the 2PHL model. Kumar et al. [7, 8] examined plane wave propagation using 3PHL and 2PHL models in an anisotropic medium. They also studied the effect of viscosity on the 3PHL model. Biswas et al. [9, 10] analyzed the 3PHL effect on various cylindrical panels with voids and rotational effects.

Phenomena that involve continuous changes in space and time are often described by equations that have fractional orders. Ezzat et al. [11] have studied the 3PHL model using the fractional-ordered Fourier law. Furthermore, Ezzat et al. [12, 13] investigated fractional thermoelasticity on infinitely long cylinders also they applied fractional derivatives to porous asphalt material. Ezzat et al. [14] extended the two-temperature GN theory to include phase lag heat transfer under fractional derivatives. Several researchers have also discussed fractional

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Memory effects in isotropic semiconductors: a three-phase lag model analysis

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Abstract

This article aims to explore the isotropic three-phase (3PH) lag magneto-photo-thermoelastic (PTE) theory in semiconductor medium, with a focus on its memory-dependent-derivative (MDD) characteristics. The equations for displacement, temperature distribution, carrier density, and stress components resulting from this theory are formulated using these characteristics and then transformed into a Fourier-Laplace vector matrix differential equation. An eigenvalue approach is used to solve this equation, and the numerical solution is obtained by inverting Fourier and Laplace transforms. Graphical results based on the characteristics of silicon material are visualized through the use of Mathematica software. The validity of the proposed model is evaluated by comparing them with previously published results. The outputs demonstrate that the impact of MDD in this 3PH model was analyzed in detail by showing the effect of coupling between thermal, plasma, and elastic waves with the presence of time-delay parameters and linear kernel function. Additionally, the presence of several kernel functions reveals significant differences in these magneto PTE quantities. The authors believe this study will help more accurately characterize materials, optimize device design, and explore nonlinear and transient phenomena in more detail.

Keywords Magneto-photo-thermoelasticity · Memory-dependent-derivative · Semiconductor medium · Three-phase-lag

1 Introduction

Recent research in thermo-elastic modeling has shown the importance of understanding how transport processes occur in various solid mediums. This includes viscoelastic, thermo-elastic, micropolar thermo-elastic, and micropolar viscoelastic mediums. While spatially resolved in situ investigations offer valuable insights, existing approaches often rely on contact methods. Photothermoelasticity (PTE) has many practical applications in fields such as laser manipulation, optical non-destructive testing, and optical waveguides. It can guide the

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Memory Effects in Anisotropic Viscothermoelastic Media: A Three Phase Lag Model Analysis

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Abstract

This study investigates the impact of memory on anisotropic visco-thermoelastic media using a novel three-phase-lag (3PHL) model. The Fourier–Laplace transform is applied to obtain the characteristic equations for phase velocity, specific loss, attenuation coefficient, and penetration depth of viscous waves. The validity of the proposed model is evaluated by comparing it with previously published results. The outputs show the coupling between phase velocity, specific loss, attenuation coefficient, and penetration depth changes with time delay parameters, illustrating the effect of memory in this 3PH model. A thorough analysis of the linear kernel function was also conducted. Additionally, the presence of several kernel functions reveals significant differences in this visco-thermoelastic medium. Numerical calculations were performed on poly-methyl material due to its high thermal conductivity, low thermal expansion coefficient, high glass transition temperature, and good creep resistance. Mathematica software is used to generate two-dimensional and three-dimensional graphical results. The author believes that this study will be useful for wave-based technologies such as ultrasonic devices and energy harvesting technologies to design more efficient models.

Keywords Memory-dependent-derivative (MDD) · Visco-thermoelasticity · Three-phase-lag (3PHL) model · Anisotropic material.

List of symbols

2PHL	Two-phase-lag
3PHL	Three-phase-lag
2D	Two-dimensional
3D	Three-dimensional
MDD	Memory-dependent-derivative
T_0	Reference temperature
τ_θ	Phase lag for temperature gradient
τ_q	Phase lag for heat flux
τ_v	Phase lag for displacement vector
κ_p, κ_q^*	Thermal conductivity
D	$\frac{\partial}{\partial t}$
D^2	$\frac{\partial^2}{\partial t^2}$

ω_1^*	Characteristic frequency
ρ	Density
V_i	Wave velocity
S	Entropy per unit mass
v_1	Longitudinal wave velocity
n_y	Normal wave vector
p	Frequency
q_i	Heat flux vector

1 Introduction

Kaliski (1963) and Lord–Shulman (1967) discussed a theory of generalized thermoelasticity that takes into account the “second sound” effect proposed by Maxwell. This theory deals with an isotropic body with hyperbolic heat conduction and a finite wave propagation speed. Green–Lindsay (1972) (GL) modified the temperature-dependent thermoelastic model by introducing two relaxation time parameters and the hyperbolic heat conduction equation. Green–Naghdi (1991) (GN) discussed type I, II, and III theories based on the balance law of entropy. Each theory assumes a different

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SOLUTION OF DIFFERENTIAL EQUATIONS BY USING DIFFERENTIAL TRANSFORM METHOD

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Abstract

In this article, differential transform method (DTM) is applied to solve initial value problems in ordinary and partial differential equations. If the system considered has a solution in terms of the series expansion of known functions, this powerful method catches the exact solution. So as to show this capability and robustness, some systems of differential equations are solved as numerical examples.

1. Introduction

The differential transform was first introduced by Zhou [1] and it is applied to solve differential equation occurred in electrical circuit analysis. The DTM is the method to determine the coefficients of the Taylor series of the function by solving the induced recursive equation from the given differential equation. The updated version of the Taylor series method which is called the differential transform method. It is possible to obtain exact solution of various Initial value problems using the concept of Differential

Key Words : *Differential transform method, Differential inverse transform, Ordinary differential equations, Partial differential equation.*

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Solution of Some Differential Equations by Using Differential Transform Method

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Abstract: In this article, differential transform method (DTM) is applied to solve initial value problems in differential equations. If the system considered has a solution in terms of the series expansion of known functions, this powerful method catches the exact solution. So as to show this capability and robustness, some systems of differential equations are solved as numerical examples.

Keywords: Differential transform method; differential inverse transform; ordinary differential equations; Partial differential equation.

1. INTRODUCTION

The differential transform was first introduced by Zhou [1] and it is applied to solve differential equation occurred in electrical circuit analysis. The DTM is the method to determine the coefficients of the Taylor series of the function by solving the induced recursive equation from the given differential equation. The updated version of the Taylor series method which is called the differential transform method. It is possible to obtain exact solution of various Initial value problems using the concept of Differential transform method. Initial value problem in the second order differential equation occurs in science and engineering fields. We extend the application of the differential transformation method which is based on Taylor series expansion to obtain analytical approximate solution of the initial value problem.

This paper is organized as, in section 2 the one-dimensional Differential transform method is described and solved some problems, in section 3 two-dimensional Differential transform method is described with example and conclusion is given in section 4.

2. DIFFERENTIAL TRANSFORMATION METHOD

Definition 1: The differential transformation of the k th derivative of function $u(x)$ is defined as follows:

$$U(k) = \frac{1}{k!} \left[\frac{d^k u(x)}{dx^k} \right]_{x=x_0} \quad (2.1)$$

and the differential inverse transformation of $U(k)$ is defined as follows:

$$u(x) = \sum_{k=0}^{\infty} U(k)(x - x_0)^k \quad (2.2)$$

In real applications, function $u(x)$ is expressed by a finite series and equation (2.2) can be written as

$$u(x) = \sum_{k=0}^n U(k)(x - x_0)^k \quad (2.3)$$

equation (2.3) implies $\sum_{k=n+1}^{\infty} U(k)(x - x_0)^k$ is negligibly small. In fact, n is decided by the convergence of natural frequency in this study. The following theorems that can be deduced from equation (2.1) and (2.2) are given below





Optimization algorithms and their applications

Sujit Handibag¹ and P. S. Sutkar²

Abstract

In the real world, there are many problems in which it is desirable to optimize one or more objective functions at the same time. These are known as single and multi-objective optimization problems respectively and continuous research is being conducted in this field and nature inspired heuristic optimization methods (also called advanced optimization algorithms) are proving to be better than the classical deterministic methods and thus are widely used. These algorithms have been applied to many engineering optimization problems and proved effective for solving some specific kinds of problems. In this paper, a review of the most popular optimization algorithms used in different problems related to the civil engineering is presented.

Keywords

Optimization algorithms, Civil engineering.

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1. Introduction

Optimization technique is nothing but the Mathematical optimization or mathematical programming is the selection of a best element with regard to some criterion from some set of available alternatives. Optimization problems of sorts arise in all quantitative disciplines from computer science and engineering to operations research and economics, and the development of solution methods has been of interest in Mathematics for centuries.

The field of data mining increasingly adapts methods and algorithms from advanced matrix computations, graph theory and optimization. In these methods, the data is described using matrix representations and the data mining problem is formulated as an optimization problem with matrix variables. With these, the data mining task becomes a process of minimizing or maximizing a desired objective function of matrix variables.

Nowadays, a rapid growth of computer performance enables and encourages new developments in civil engineering

as well as related areas. For instance, the construction industry investigates new designs with minimum cost, minimum CO₂ emissions, or embodied energy, among other objectives. Applications of optimization techniques are most exciting, challenging, and of truly large scale when it comes to the problems of civil engineering in terms of both quality and quantity. In order to overcome the difficulties, researchers are interested in advanced optimization techniques. The aim of this special issue is to collect the studies using optimization algorithms in civil engineering problems such as structural engineering, construction management and environmental engineering.

Optimization problem is defined as finding the best solution from the feasible solution in a pool which contains all solutions. In many engineering problems, the optimal solution can be the minimum or maximum value of the objective function of the problem. Sometimes, the optimization problem might have multiple objective functions and multiple solutions. Also, the optimization problems can be classified as size, shape, and topology, discrete, continuous, single or multi-objective optimization. The application of optimization to real word engineering problems is quite recent, mainly due to the complexity of mathematical models, described by non-linear functions and generating a non-convex space of solutions. With the advent of advanced optimization methods, last decades have witnessed a growing application of optimization to a wide range of engineering problems, from automotive to biomedicine, and of course, to civil engineering. Applications of optimization techniques are most exciting.




PRINCIPAL
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Amplification of Heat Transfer in Three Immiscible Fluids: Micropolar Nanofluid Encased with Porous Matrix

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An investigation of the micropolar nanofluid sandwiched between permeable fluids enclosed in a horizontal channel is illustrated. The flow is modeled using Tiwari-Das single phase model to interpret the nanofluid and Brinkman model to define the permeable fluid. Closed form solutions are accomplished in the three regions utilizing the boundary and interface conditions. Graphical results are sketched for the reaction of material parameter, solid volume fraction, porous parameter, Eckert number, nanoparticles and cell rotational viscosity for the linear velocity, microrotation velocity and temperature. The skin friction, Nusselt number and mass flow rate are also reckoned. Velocity and temperature are down toned with material parameter, solid volume fraction and porous parameter whereas Eckert number develops the temperature. The optimal Nusselt values are obtained for Graphite oxide when compared with copper, silver and copper oxide nanoparticles.

KEYWORDS: Micropolar Nanofluid, Porous Matrix, Immiscible Fluids, Tiwari-Das Model, Perturbation Method.

1. INTRODUCTION

The study of micropolar fluids has piqued attention since the Navier-Stokes equations for Newtonian fluids fail to adequately represent the properties of a fluid containing suspended particles.¹ Polycrystalline materials, fluid containing additives and the materials with coarse grain structure fall in these categories. The skin friction near a rigid body is greatly reduced by a little amount of additive in the fluid, and the frictional drag is likewise lowered by a polymer concentration.² The physical character of asymmetric deformation of these materials is not correctly predicted by classical continua. Eringen's theory of micropolar fluids^{3,4} is one of the best fluid theories for describing the deformation of such materials. Some examples of such fluids are polymeric suspensions, unusual lubricants, biological fluids, liquid crystal solidification, muddy fluids, and nematicogenic and smectogenic liquid crystals. Micropolar fluids are a type of fluid that exhibits microscopic effects as a result of the local structure and micro movements of the fluid element. Spin inertia influences stress and body moments in these fluids, which contain dilute suspensions of rigid macro molecules with individual motions that support stress and body moments. In addition to the traditional

Newtonian fluids, the interaction of the macro velocity field and micro rotation field can be characterized using novel material constants. The Navier-Stokes equations for a viscous and incompressible fluid are included in Eringen's micropolar fluid model as a particular case. A micro rotation vector and a gyration parameter, in addition to the classical vector field, are included in the equation governing the flow of a micropolar fluid. The notion of conservation of local angular momentum must be represented by an additional transport equation in the micropolar fluid theory. Eringen³ and Lukaszewicz⁶ provided comprehensive reviews of the theory and applications of micropolar fluids.

Umavathi et al.⁷⁻¹¹ researched on the stability and heat transfer of micropolar fluids. Micropolar fluid filled inside a tube was researched by Dupuy et al.¹² Using thorough asymptotic analysis, Pazzani¹⁴ looked into the stationary motion of a micropolar fluid in a thin curved pipe. Benes and Pazzani¹⁵ used asymptotic analysis to investigate incompressible micropolar fluid flow over a numerous pipe system. Umavathi and her research group¹⁶⁻²³ worked on two/three immiscible fluids in various geometries, using the interface condition described by Vafai and Thiyagaraja.²⁴

Effective regulation of heat transfer phenomena is one of the most difficult issues in modern industrial operations. In industrial applications such as electric power generation and transportation, microelectronics, high-energy device

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MICROPOLAR NANOFLUID ENFOLDED WITH VISCOUS FLUID: THREE LAYER FLOW

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ABSTRACT

KEYWORDS:

Micropolar fluid, nanofluid, viscous fluid, heat transfer, Nusselt number.

The present work deals with the study of micropolar nanofluid enveloped between viscous fluid flowing past a horizontal conduit. Analytical solutions are found for all the three layers. The homogeneous Tiwari–Das and Eringen micropolar models are adopted to define the balanced law equations. Velocity, microrotation velocity and temperature are reckoned for discrete bounds such as material parameter, solid volume fraction, Eckert number, nanoparticles and cell rotation viscosity. The analysis is also carried out for the skin friction, mass flow rate and Nusselt number. It is contemplated that the linear velocity and temperature distributions are deprived for solid volume fraction and material parameter, whereas Eckert number expands the energy. Highest Nusselt values are attained for Graphite oxide. The cell rotation viscosity on the velocity and temperature are tabulated for regular and nanofluid considering water and Glycerin as base fluids.

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Micropolar Nanofluid Wedged Between Permeable Fluid Saturated with Nanoparticles

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This paper aim to discuss micropolar nanofluid stuffed between permeable nanofluids in a horizontal channel. Single phase Two-Phase model is used to define nanofluid and Brinkman model to define permeable fluid. Using appropriate boundary and interface conditions, closed form elucidation are evaluated with the help of perturbation method. The response of governing parameters like porous parameter, solid volume fraction, material parameter, Eckert number, and cell rotational viscosity on linear velocity, microrotation velocity and temperature are presented in graphical and tabular form. It is dissipated that the material parameter, solid volume fraction and porous parameter reduces velocity and temperature, whereas Eckert number promotes the temperature. The Nusselt numbers are not much varied for any of the nanoparticles. Combinations of immiscible micropolar fluids and nanofluids provide excellent advantages in the fields of renewable energy, biomedicine, plasma physics, geophysics, and petroleum industry.

KEYWORDS: Micropolar Fluid, Nanofluid, Horizontal Channel, Porous Matrix.

1. INTRODUCTION

In recent years, forced convection in an area that is partially stuffed with a clear fluid and partly by a fluid-saturated porous media has drawn a lot of interest and became the focus of multiple studies¹⁻³. This topic has attracted research since it pertains to several important thermal engineering applications, such as heating systems, solid matrix, the use of porous materials to promote energy transfer, as well as the solidification of binary alloys. Heures and Joseph⁴ were the first to explore momentum transport at the fluid-porous interface region. After performing an experimental research, Heures and Joseph⁴ focused on the fluid-porous interface when exploring the slip flow boundary condition. The problem of immiscible fluid flow has an important aspect in medicine and chemical engineering. The allowed him et al.⁵ to precisely solve the problem of laminar flow of two immiscible liquids between two parallel surfaces. Mitra⁶ worked into the multiple flow of two electrically charged fluids between two rigid parallel plates. Theoretical and experimental analyses done on the stratified laminar flow of two immiscible fluids in a horizontal tube^{7,8}. This system has attracted the interest because it has the potential to reduce the power required to pump oil through a pipeline by incorporating nanoparticles in the process. Precise numerical modeling of the

flow at the fluid-porous boundary was done by Saitou and Kawaguchi⁹. Ochoa-Tapia and Whitaker¹⁰ provided more insight into this issue.

Fluids with a microstructure that fall under the category of polar fluids have non-symmetrical stress tensors and are referred to as micropolar fluids. Physically, they are the fluids consisting of randomly distributed particles in a viscous medium, and the internal structures of this fluid take into account the connection between the macroscopic velocity field and each particle's spin. This is hydrodynamical framework that is ideal for granular systems containing particles with a macroscopic velocity field. It's a hydrodynamic structure for granular systems made up of macroscopic-sized particles that's useful for scientists and engineers dealing with hydrodynamic fluid problems and phenomena. Metallic oxides, dental creams, clay-water suspensions, paintings, and thicker hydrocarbon greases are some examples of the granular system. Biongel¹¹ pioneered the theory of micropolar and Arimura et al.^{12,13} provided comprehensive evaluations of micropolar fluid applications. Micropolar fluids are becoming increasingly popular due to the growing demand for engineering practices in medical, mechanical engineering, and the chemical industry. As a result, a number of research initiatives have been completed, including the study of surface roughness, squeeze film lubrication problem¹⁴ and a novel application of a computational heuristic paradigm that is hampered in a cell model application. Klumkaeva et al.¹⁵ assembled a swarm of solid cylindrical particles with a porous layer

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ARTICLE

SOME SIGNIFICANT PROPERTIES OF THE INTERSECTION GRAPH DERIVED FROM TOPOLOGICAL SPACE USING INTERSECTION OF OPEN SETS

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Abstract

In this paper, we introduce a graph structure, called intersection graph $\gamma(\tau)$ on a topological space (X, τ) where the vertex set is the collection of non-empty proper open subsets of a topological space X and two vertices U_1, U_2 are adjacent if and only if $U_1 \cap U_2 \neq \emptyset$. The diameter, girth, connectivity, maximal independent sets, different variants of domination number, clique number and chromatic number, degree and connectivity of $\gamma(\tau)$ and neighbourhood of open set are

Received: May 1, 2019; Revised: May 19, 2019; Accepted: July 2, 2019

2010 Mathematics Subject Classification: 05C25, 05C69.

Keywords and phrases: diameter, girth, clique number, chromatic number, domination number, maximal independent set.


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Open subset inclusion graph of a topological space

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Abstract

In this paper we introduce a graph topological structure, called open subset inclusion graph of a topological space $\mathcal{J}(\tau)$ on a finite set X , where the vertex set is the collection of nonempty proper open subsets of a topological space and two vertices U_i, U_j are adjacent or $U_i - U_j$ or $(U_i, U_j) \in \mathcal{E}$, if either $U_i \subset U_j$ or $U_j \subset U_i$. The diameter, girth, connectivity, maximal independent sets, different variants of domination number, clique number and chromatic number, degree of $\mathcal{J}(\tau)$, edge and vertex connectivity of $\mathcal{J}(\tau)$ are studied

Subject Classification: (2010) 05C25, 05C69, 05C07, 05C12

Keywords: Discrete topology, Graph, Clique, Chromatic number, Domination set, Independence set.

1. Introduction

Apart from its combinatorial motivation, graph theory also helps to characterize various algebraic structures by means of studying certain graphs associated to them. Till date, a lot of research, e.g., [1, 2] has been done in connecting graph structures to various algebraic objects. Recently,

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SOME PROPERTIES OF THE UNION GRAPH DERIVED FROM TOPOLOGICAL SPACE USING UNION OF OPEN SETS

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Abstract

In this paper, we introduce a graph structure, called union graph $\mathcal{U}(\tau)$ on a topological space (X, τ) , where the vertex set is the collection of non-empty proper open subsets of a topological space X and two vertices U_1, U_2 are adjacent if and only if $U_1 \cup U_2 = X$. The diameter, girth, connectivity, maximal independent sets, different variants of domination number, clique number and chromatic number, degree and connectivity of $\mathcal{U}(\tau)$ and neighbourhood of open set are studied. It is shown that if (X, τ) is the discrete topological space and

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2010 Mathematics Subject Classification: 05C25, 05C69, 05C07, 05C12.

Keywords and phrases: discrete topology, graph, clique, chromatic number, domination set, independence set.



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Some properties of open subset intersection graph of a topological space

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Abstract

In the recent paper, authors introduced a graph topological structure, called open subset intersection graph of a topological space $\Upsilon(\tau)$ on a finite set X . In this present paper, we continue the study of the graph $\Upsilon(\tau)$ on a finite set X . It is shown that, if τ is a discrete topology on X and $|X| \geq 3$, then the graph $\Upsilon(\tau)$ is not bipartite and regular. If τ is a discrete topology on X with $|X| = 3$ then it is shown that the $\Upsilon(\tau)$ is an edge-transitive graph, Perfect graph, Eulerian and Hamiltonian graph. Moreover, we determine exact value of the independence number, vertex connectivity and edge connectivity of the graph $\Upsilon(\tau)$.

Subject Classification: (2010) 05C25, 05C69, 05C07, 05C12.

Keywords: Discrete topology, Graph, Clique, Dominating set, Independence set, Distance regular, Eulerian graph, Edge and vertex connectivity.

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Automorphism group of the open subset inclusion graph of a topological space

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Abstract

In this paper, we determine automorphisms of $\mathcal{J}(X, \tau)$ and prove some results on $\mathcal{J}(X, \tau)$, when topological space (X, τ) is finite. Also we determine necessary and sufficient condition for the open subset inclusion graphs of (X, τ_1) and (X, τ_2) to become isomorphic. Moreover, the topological space (X, τ) whose corresponding open subset inclusion graph is complete, is characterised.

Subject Classification: (2010) 05C25, 05C63, 05C07, 05C12.

Keywords: Automorphisms of graphs, Open subset inclusion graphs of topological space, Discrete topology, Girth, Clique, Connected graph.

1. Introduction

Graph theory is rapidly moving into the mainstream of mathematics mainly because of its applications in diverse fields. An idea of zero divisor

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Some significant results on open subset inclusion graph of a topological space

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Abstract

In the recent paper R. A. Muneshwar and K. L. Bondar, introduced a graph topological structure, called open subset inclusion graph of a topological space $f(\tau)$ on a finite set X . In the present paper, we continue the study of the open subset inclusion graph of a topological space $f(\tau)$ on a finite set X regarding some important properties. It is shown that, if (X, τ) is a discrete topological space and $|X| = 3$, then the graph $f(\tau)$ is bipartite, regular, distance transitive, distance regular, Hamiltonian as well as vertex and edge-transitive. Also if (X, τ) is a discrete topological space and $|X| = 3$ then the graph $f(\tau)$ has a perfect matching and vertex connectivity and edge connectivity 2.

Subject Classification: (2010) 05C25, 05C68, 05C07, 05C12, 05C45, 05C48, 05C99.

Keywords: Discrete topology, Graph, Independent set, Distance regular, Hamiltonian graph, Edge and vertex connectivity.

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Some results on an intersection graph of a topology

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Abstract

In this paper, we introduce a graph topological structure, called Intersection Graph $I_1(X) = (V(\tau), E(\tau))$, where $V(\tau) =$ Collection of all topologies defined on X other than τ_1 and τ_2 and for $\tau_1, \tau_2 \in V(\tau)$, $\tau_1 \sim \tau_2$ or $(\tau_1, \tau_2) \in E(\tau)$ if and only if $\tau_1 \cap \tau_2 \neq \tau_1$. The diameter, girth, connectivity, maximal independent sets, different variants of domination number and chromatic number of $I_1(X)$ are studied. Moreover, we also derive upper and lower bounds of clique number and chromatic number of the graph $I_1(X)$.

Subject Classification: 05C25, 05C69, 05C97, 05C12.

Keywords: Topology, Graph, Diameter, Girth, Clique number, Chromatic number, Domination number, Independence Number.

1. Introduction

The study of graph associated with a commutative ring R was initiated by Beck[2]. The graph structures regarding various algebraic structures

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Some properties of open subset intersection graph of a topological space

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
Abstract

In the recent paper, authors introduced a graph topological structure, called open subset intersection graph of a topological space $T(\tau)$ on a finite set X . In this present paper, we continue the study of the graph $T(\tau)$ on a finite set X . It is shown that, if τ is a discrete topology on X and $|X| \geq 3$, then the graph $T(\tau)$ is not bipartite and regular. If τ is a discrete topology on X with $|X| = 3$ then it is shown that the $T(\tau)$ is an edge-transitive graph, Perfect graph, Eulerian and Hamiltonian graph. Moreover, we determine exact value of the independence number, vertex connectivity and edge connectivity of the graph $T(\tau)$.

Subject Classification: (2010) 05C25, 05C63, 05C17, 05C12.

Keywords: Discrete topology, Graph, Clique, Dominance set, Independence set, Distance regular, Eulerian graph, Edge and vertex connectivity.

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Dr. R. A. Munesliwar

Solution of linear and non-linear partial differential equations of fractional order

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Abstract

We know that the solution of partial differential equations by analytical method is better than the solution by approximate or series solution method. In this paper, we discuss the solution of linear and non-linear fractional partial differential equations involving derivatives with respect to time or space variables by converting them into the partial differential equations of integer order. Also we develop an analytical formulation to solve such fractional partial differential equations. Moreover, we discuss the method to solve the fractional partial differential equations in space as well as time variables simultaneously with the help of some examples.

Mathematics Subject Classification: 26A33, 35R11, 34A08.

Keywords: α -fractional derivative and integral, Fractional linear and non-linear partial differential equation, Method of separation of variables.


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A FRACTIONAL APPROACH TO SOLVE A MATHEMATICAL MODEL OF HIV INFECTION OF $CD4^+T$ CELLS

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Abstract. A mathematical model that calculates susceptible $CD4^+T$ cells, infected $CD4^+T$ cells and virus particles has been examined here using the fractional differential transform method (FDTM) with stability analysis. A stability of the fractional nonlinear model with Hurwitz state matrix is examined using the Lyapunov direct method. A nonlinear mathematical model of differential equations has been put forward and analyzed by applying FDTM. An infinite series solution of the system of differential equation is computed by defining fixed components with different time intervals. Furthermore, the solution calculated through FDTM (integer order) is correlated with the solution calculated using DTM and LADM. The solution is analyzed numerically and graphically by using the software Python.

Keywords: Lyapunov direct method; fractional differential transform method; HIV infection; $CD4^+T$ cells.

2010 AMS Subject Classification: 34A08, 37B25.

1. INTRODUCTION

Human immunodeficiency virus (HIV) infection is a disease which impacts on the immune system of human being caused by the HIV virus (avert.org). HIV corrupts the white blood cells

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Existence and Uniqueness of Solutions for Neutral Stochastic Fractional Integro-Differential Equations with Impulses by A Rosenblatt Process

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Abstract

In this paper, we will discuss existence and uniqueness of mild solution of the abstract Cauchy problem of fractional order, by using the Banach fixed point theorem and the theory of resolvent operator.

Mathematics Subject Classification: 2010 MSC: 26A33, 34A12, 35R60

Keywords: Fractional derivative and integral, Existence and uniqueness, mild solution, Banach fixed point theorem, Resolvent operator

1 Introduction

Some results on the problem of the existence and uniqueness of Mild solution for stochastic fractional differential equations have been discussed by some authors which can be found in [1, 2, 3]. Also The existence and uniqueness of mild solution of an impulsive stochastic system by a Rosenblatt process have been discussed in [6, 7, 8, 9]. The purpose of this paper is to discuss the existence and uniqueness of solution of differential equation of fractional order, by using the Banach fixed point theorem and the theory of resolvent operator.

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Existence and Uniqueness of Solutions for Fractional SDEs with
Discontinuous Drift and Finite Activity Jumps and Non-linear
Fractional Fredholm–Volterra Integral Equation with
Modified Argument via Geraghty Contractions

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Abstract

In this paper, some result on the existence and uniqueness of strong solutions to multi-dimensional stochastic fractional differential equation with discontinuous drift and finite activity jumps by using a tailor-made transformation method have been discuss. Moreover we will also discuss, the existence and uniqueness conditions for the solution of fractional order nonlinear Fredholm–Volterra integral equation with a modified argument using the extended fixed point results for Geraghty contractions in b - metric space.


Mathematics Subject Classification: 2010 MSC: 26A33, 34A12, 60H10, 37C25,45G10

Keywords: Fractional derivative and integral, Existence and uniqueness of Strong solutions, Multi-dimensional jump-diffusion, Geraghty contraction, fixed point, modified argument

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Existence and Uniqueness of Solution of Fractional Differential Equation for the Ocean Flow in Arctic Gyres and Mild Solution of Fractional Volterra Integrodifferential Equations

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Abstract

In this paper, some results on the existence and uniqueness of fractional differential equations ocean flow in arctic gyres by using Schauder's fixed point technique and Bihary inequality have been discuss. Moreover, we will also discuss, the existence and uniqueness of mild solution of initial value problem of fractional order subjected to non-local conditions, by using the Banach fixed point theorem and the theory of strongly continuous cosine family.

Mathematics Subject Classification: 2010 MSC: 34A08, 34A12, 76B03, 37C25


Keywords: Fractional differential equation, Existence and uniqueness, Mild solutions, Banach Fixed point theorem, Ocean gyre


1 Introduction

Some results on the problem of existence and uniqueness of solution of differential equations of fractional order have been discussed by some authors which can be found in [1, 2, 3, 4, 5]. The purpose of this paper is to discuss

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HIV – 1 Infection Model Calculating Infected Cells and Viral Load in Plasma using Differential Transform Method.

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Abstract

A mathematical model that determines the number of infected cells and viral load in plasma, in HIV – 1 infection has been presented in this paper using a differential transform method (DTM). A different approach to solve the system of differential equation with initial condition has been illustrated with the definition of DTM and requisite proof of some standard results. As DTM provides the series solution which confirms the accuracy of the solution. The obtained result portray that DTM is productive method for finding the number of infected cells and viral load in plasma during the treatment of HIV – 1 infected person. Further, the numerical calculation and graphs validates the result.

Keywords: DTM, System of Differential equation and HIV – 1 infection.

1. INTRODUCTION

An infectious disease causes due to the presence of pathogenic microbial carrier. Microbial carriers can be bacterial, viral, fungal, and parasitic. HIV and influenza are the viral diseases. HIV (Human Immunodeficiency Virus) has been entered in humans from a chimpanzee in central Africa.[www.CDC.gov]. The virus version that arrived from Chimpanzee is called Simian immunodeficiency virus. This virus was transmitted to humans when humans came in contact with the infected blood. Transmission of HIV can occur through a variety of pathways. It can be transmitted from person to person through direct and indirect mode. Sexual contact and touching fall under the category of direct mode and indirect contact includes like exchange of infected objects, blood or other body fluids. Though there is no evidence that the touching is responsible for spreading the diseases. Vertical transmission is also a mode of transferring HIV [1]. Vertical transmission happens when disease is transmitted to a child before or at the birth by its mother.


Viruses are microbial agents that regenerate themselves and multiply [1]. When the virus enters into the environment that suitable for their growth, they start infecting to the host cells and transport their genetic properties to the host cells. On getting entered into the human body HIV infects vital cells in the immune system like CD4⁺T cells, macrophages and dendritic cells and starts replicating quickly. Getting infected through HIV leads to a decline in the level of CD4⁺T cells. When the CD4⁺T cells count, normally around 1000/ μ L and decreases to 200/ μ L or below a person is said to suffer from a disease AIDS.

Without treatment a person with HIV infection typically passes through three stages, Acute HIV infection, Chronic HIV infection and AIDS (Acquiring Immunodeficiency Syndrome). Numerous mathematical models have been developed to define the relation between the immune system and HIV infection [1].The models given by Kermack and McKendrick (1927, 1932 and 1933) on epidemiology to Perelson (1989) on primary infection with HIV were important developments this area and now in recent years many mathematical models have been given and ample research has been carried



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Solution of linear and non-linear partial differential equations of fractional order

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Abstract

We know that the solution of partial differential equations by analytical method is better than the solution by approximate or series solution method. In this paper, we discuss the solution of linear and non-linear fractional partial differential equations involving derivatives with respect to time or space variables by converting them into the partial differential equations of integer order. Also we develop an analytical formulation to solve such fractional partial differential equations. Moreover, we discuss the method to solve the fractional partial differential equations in space as well as time variables simultaneously with the help of some examples.

Mathematics Subject Classification: 26A33, 35R11, 34A08.

Keywords: α -fractional derivative and integral, Fractional linear and non-linear partial differential equation, Method of separation of variables.




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Some results of inclusion graph of a topology

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Abstract

In this paper, we introduce a graph topological structure called Inclusion Graph of a Topology $\mathcal{I}_c(X) = (V(r), E(r))$. The diameter, girth, connectivity, maximal independent sets, different variants of domination number and chromatic number $\chi_c(X)$, edge and vertex connectivity of $\mathcal{I}_c(X)$ are studied. Moreover, we derive the upper and lower bounds of clique number and a chromatic number of the graph $\mathcal{I}_c(X)$.

Subject Classification: 05C25, 05C68, 05C07, 05C12.

Keywords: Topology, Graph, Diameter, Girth, Clique number, Domination number, Independence number.

1. Introduction

Graph theory has many applications in various fields. Beck[2] introduced the zero divisor graph of a commutative ring with unity. A lot of research had been done on graph structures of various algebraic


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ON THE DIVISOR GRAPH OF FINITE COMMUTATIVE RING

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Abstract. In this paper, we introduce a graphical structure of non empty finite commutative ring R called as divisor graph of R , denoted as $D[R]$, is undirected simple graph with vertex set $V = R - \{0, 1\}$ and for distinct vertices $a, b \in V$, $a \sim b$ if and only if either $a \mid b$ or $b \mid a$, i.e. $\exists c \in R$ such that $a = bc$ or $b = ac$. We will discuss structure and properties of divisor graph of ring Z_n . Moreover, we also determine diameter, girth, eulerian, planar, clique number of the $D[Z_n]$, $\forall n$. The main objective of this paper is to study interplay of ring theoretic properties of R with graph theoretic properties of $D[Z_n]$.

Keywords: graph; Eulerian graph; connected graph; girth; clique number; chromatic number.

2010 AMS Subject Classification: 05C25, 05C45, 05C69, 05C07, 05C12.

1. INTRODUCTION

The study of zero divisor graph was initiated by I. Beck[6] in 1988. He introduced graph to commutative ring with vertex set as set of all zero divisors. Then Anderson and Livingston[4] has changed vertex set which was defined by I.Beck[6] and studied the properties of zero divisor

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SOLVING SYSTEMS OF FRACTIONAL DIFFERENTIAL
EQUATIONS USING CONFORMABLE FRACTIONAL
DIFFERENTIAL TRANSFORM METHOD

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Abstract: We extend a novel three-dimensional differential transform technique generalisation. The three-dimensional differential transform technique, fractional power series expansions, and conformable fractional derivative are used in the novel generalisation. The novel approach is used to solve a nonlinear system of fractional differential equations. Finally, numerical examples are shown to demonstrate the precision and efficacy of the new methodology, as well as to compare it to the solution derived using the previous method. In addition, solutions are graphically analysed using Python software.

Keywords and Phrases: Fractional Differential Equation, Conformable fractional derivative, Differential transform method.




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Solution of Fractional Differential Equations by Using Conformable Fractional Differential Transform Method with Adomian Polynomials



R. S. Teppawar, R. N. Ingle, and R. A. Muneshwar

Abstract The conformable fractional differential transform method (CFDTM) with Adomian polynomials are used in this work to solve fractional differential equations (FDEs). We shall solve nonlinear and singular Lane–Emden equations by employing this innovative approach. We first compute the differential transform (DT) of the nonlinear term in the conformable fractional sense, but in our novel technique, we substitute such nonlinear terms with recurrence relations in their Adomian polynomial of index m . The components of the dependent variable are eventually replaced by FDT of the same index. Because Adomian polynomials may be used for analytic nonlinear function, the CFDTM becomes much more helpful and significant. Furthermore, we compute the solution for nonlinear FDEs by using CFDTM with Adomian polynomials and these solutions are correlated with solutions calculated by using FDT method. The solutions are analyzed numerically and graphically by using Python software and the outcomes show that this technique is very effective and simple.

Keywords Fractional differential equation · Conformable fractional differential transform method · Adomian polynomials · Singular Lane–Emden equation

1 Introduction and Preliminaries

Fractional calculus has grown more relevant in mathematical study in recent decades. There is no standard form for fractional derivative definition. However, the most widely employed definitions are found in [7, 10]. Recently, several authors [2, 8] proposed a new limit concept for fractional derivatives, from which he deduced various results of fractional derivatives.

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Generalized Results on Existence & Uniqueness with Wronskian and Abel Formula for α -Fractional Differential Equations



R. A. Muneshwar, K. L. Bondar, V. D. Mathpati, and Y. H. Shirole

Abstract R. A. Muneshwar et al. has proposed a new α -fractional derivative notion based on the limit. This topic will be continued in this article, and some conclusions on existence and uniqueness theorems for linear α -fractional differential equations will be discussed. Moreover, we derived the Wronskian determinant formula and Abel's formula for α -fractional differential equations. In addition, we provide applications of the obtained results.

Keywords Fractional derivative · Existence and uniqueness theorems · Abels formula

1 Introduction and Preliminaries

The idea of fractional derivation has gained prominence in mathematical study during the last few decades. There is no known method for obtaining an exact solution to fractional differential equations [12, 13, 17], however there are approximate and numerical solutions. For defining the fractional derivative, there is no standard form. However, the Riemann-Liouville and Caputo definitions of fractional derivatives are the most often utilised. Some writers have recently suggested a revised definition of the fractional derivative [11]. Later, many authors studied this new theory, which can be found in [1–3, 10]. Several investigations on this theory and the application of fractional differential equations based on Hadamard, Riemann-Liouville, and Caputo derivatives have been found in the literature [5, 6, 14, 15, 17].

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Some Results on Complement of Open Subset Inclusion Graph of a Topological Space

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Abstract

In the recent paper, authors introduced a graph topological structure, called an open subset inclusion graph $f(\tau)$ of a topological space (X, τ) on a finite set X and discussed some important properties of this graph. In this paper, the researcher discuss some properties such as diameter, girth, connectivity, maximal independent sets, different variants of domination number, clique number and chromatic number, degree of $f(\tau)^c$, edge and vertex connectivity of the graph $f(\tau)^c$.

Mathematics Subject Classification: 2010 MSC: 05C25, 05C49, 05C07, 05C12

Keywords: Discrete Topology, Graph, Clique, Chromatic Number, Domination Set, Independence Set.

1 Introduction

If R is a commutative ring with unity then the zero divisor graph of R was firstly introduced by Beck[2], which is defined as, if R is any ring then $G(R)$ denotes the zero divisor graph of R whose vertex set is $V = R$, such that any distinct vertices x and y are adjacent if and only if $x \cdot y = 0$.

In the recent decades, graphs of several algebraic structures were defined which can be found in [1, 3]. Among these graphs, zero divisor graphs of ring and module are more attractive for many researchers. A. Das[4, 5, 6], introduced the graphs of a vector space & he also discussed some results on these graphs.

The graphs of a vector space were also studied independently by some authors which can be found in [7] and [11]. Some properties on incomparability graphs $\Gamma(L)$ of lattices L were discussed by Wasadkar, M. and Survase P[12]. They classified lattice L by using the graph $\Gamma(L)$ of a lattice L . As Graph theory has wide range of applications in various fields this motivated us to introduce new concept of graphs of topological space (X, τ) with some important properties of these graphs which can be found in [8, 9, 10]. In[8], authors introduced the graph $f(\tau)$ of τ , which is defined as follows.

Definition 1.1. [8] Open Subset Inclusion Graph of a Topological Space: Let X be a finite set and τ be a topology defined on X then a graph $f(\tau) = (V(\tau), E(\tau))$ is called as an open subset



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ANALYTICAL SOLUTIONS OF COVID-19 FRACTIONAL ORDER MATHEMATICAL MODEL BY CONFORMABLE FRACTIONAL DIFFERENTIAL TRANSFORM METHOD

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Abstract

In this paper, we will discuss an analytical solution and numerical simulation of fractional order mathematical model on COVID-19 under conformable sense with the help of conformable fractional differential transform method for different values of order η , where $\eta \in (0, 1]$. The underlying mathematical model on COVID-19 is consist of four compartments, like, susceptible class, healthy class and infected class, quarantine class. We conclude that use of fractional epidemic model provides better understanding and biologically more insights about the disease dynamics.

1. Introduction

The different models on the CORONA virus disease have been discussed by some authors using the various methods like Adams-Moulton type, Laplace transform coupled with Adomain decomposition method, generalized-Bashforth-Moulton method, q -homotopy analysis transform method which can be found in [1, 2, 3, 4, 5].

2020 Mathematics Subject Classification: 26A33, 37M05.

Keywords: conformable fractional model, COVID-19, numerical simulation, analytical solution, conformable fractional differential transform method.

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Some Properties on Modified α -Fractional Partial Derivative with its Applications

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Abstract. Some authors proposed the notion of a modified α -fractional derivative. We shall continue our investigation of modified α -fractional derivatives in this study and arrive at some conclusions. A multi-variable Modified α -fractional derivative for a vector valued function with several variables is also introduced. We'll also go through some results on the Modified α -fractional partial derivative of a real-valued function with n variables. We also provide applications for these findings and numerical simulations demonstrate the importance and simplicity of this novel technique.

INTRODUCTION

Fractional derivation theory has been more important in mathematical study during the last few decades. There is no known method for finding an accurate solution to fractional differential equations [11, 12, 16], however there are approximate and numerical solutions. The fractional derivative has no standard form. Definitions of fractional derivatives are the Riemann-Liouville and Caputo definitions. R. Khalil et al. [10], recently proposed a new definition of the fractional derivative and fractional integral. Later, many authors studied this new theory, which can be found in [1, 2, 3, 4, 9]. Numerous researches has been conducted on this idea and its implementation of sequential linear fractional differential equations based on Hadamard, Riemann-Liouville, and Caputo derivatives have been discovered in the literature [5, 6, 13, 14, 16]. Certain authors explored some conclusions on conformable fractional partial derivatives, which may be found in [8, 19, 20]. For unknown terms of ordinary differential equation, reader can refer [7].

α - FRACTIONAL DERIVATIVE

By making certain relevant modifications to the conventional definition of an ordinary derivative, which is defined by, R. A. Muneshwar et al. [15], created the idea of α -fractional derivative and integral.

Definition 1. α -Fractional Derivative [15] Let $\Phi: [0, \infty) \rightarrow \mathbb{R}$ and $\zeta > 0$ then α -fractional derivative of order α is defined by

$$T_{\alpha}(\Phi(\zeta)) = \lim_{\mu \rightarrow 0} \frac{\Phi(\zeta e^{\mu \zeta^{1-\alpha}}) - \Phi(\zeta)}{\mu} \quad (1)$$

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Conformable Fractional Order COVID - 19 Model: Discretization and Stability Analysis

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Abstract: The comparative study has been done on the COVID - 19 mathematical model to discuss the discretization process using two fractional operators namely Caputo and Conformable. We converted the integer order model into fractional order and then discretization method is applied to the model. The autonomous nonlinear mathematical model of COVID - 19 containing isolation class has been taken here to discuss the discretization process. A COVID - 19 mathematical model containing four different classes, namely, X (Susceptible Class), Y (Exposed Class), Z (Infected Class) and W (Isolated Class) has been taken for the proposed method. The asymptotic stability of the model is done using the Conformable derivatives. The analysis of the result is given for three different orders by assigning the numerical values to the parameters with initial conditions. Lastly, in graphical analysis, the graphs for fractional order discretized model and integer order using RK4 numerical method are analyzed. The graphs are plotted using the software Python.

Keywords: Caputo Fractional Operator; Conformable Fractional Operator; COVID - 19; RK4 Method.

INTRODUCTION

The outbreak of COVID - 19 has captivated the attention of many scientists from all over the branch. It is most trending topic for all the mathematicians who are working in mathematical modelling area. Very first paper can be checked in April - 2020 and after that there are numerous mathematical models and their analysis can be looked over in this area [18,19,20,21,22]. The mathematical model for coronavirus illness 2019 with isolation class is investigated in this paper which was given by Anwar Zeb et al.[18]. An extended version of SIR model is discussed here with two extra variables: Exposed population and Isolated population. Let's start with the model;

$$\begin{aligned}x'(t) &= \mu - \mu x(t) - \beta N x(t)(y(t) + z(t)) \\y'(t) &= \beta N x(t)(y(t) + z(t)) - \pi y(t) - (\mu + \gamma)y(t) \\z'(t) &= \pi y(t) - (\sigma + \mu)z(t) \\w'(t) &= \gamma y(t) + \sigma z(t) - (\theta + \mu)w(t)\end{aligned}\tag{1}$$

With initial conditions:

$$x(0) = x_0 \geq 0, y(0) = y_0 \geq 0, z(0) = z_0 \geq 0, w(0) = w_0 \geq 0\tag{2}$$

The first four equations are unaffected by Recovered population variable, hence we left last equation for the calculations. The non-dimensional form of the model is taken for calculations [18]. The parameters present in the equations and their descriptions can be referred from the table 1. Fractional derivative is an extension of the classical

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Some Properties of the Complement of Intersection Graph Derived from Topological Space Using Intersection of Open Sets

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Abstract. In our most recent article, we construct a graph structure known as an intersection graph $\gamma(\tau_d)$ on a topological space (X, τ_d) . Now, in this article, we'll look at some of the features of the complement of $\gamma(\tau_d)$ such as diameter, girth, connectivity, maximal independent sets. It is demonstrated that if τ is the discrete topology on X and $|X| > 2$, then $\gamma(\tau_d)^c$ is connected graph and we also determine its diameter and girth. The main finding of this study is, if τ_d is the discrete topology on X , & $|X| \geq 3$, then $\gamma(\tau_d)^c$ satisfies Beal's conjecture. Moreover, different variants of domination number, degree and connectivity of $\gamma(\tau_d)^c$ and neighborhood of open sets in the graph $\gamma(\tau_d)^c$ are studied.

INTRODUCTION

Beck [2], first introduced the zero divisor graph of R if R is a commutative ring with $1 \in R$. Graphs of several algebraic structures have been defined in recent decades, and can be found in [1, 3, 7, 11, 12]. Among these, many academics prefer the zero divisor of module and ring. A. Das [4, 5, 6], presented graph of vector space & described certain findings on these graphs. Because graph theory has so many applications in so many domains, we decided to present a new idea of topological space graphs (X, τ_d) along with certain key aspects of these graphs, which may be found in [8, 9, 10]. The reader can refer to [13, 14, 15], for undefined terms.

THE INTERSECTION GRAPH OF A TOPOLOGICAL SPACE

The graph $\gamma(\tau_d)$ of τ_d , defined as follows, was introduced by the authors in [8].

Definition 1. The Intersection Graph of τ_d : Let τ_d be the topology on X then an Intersection Graph of τ_d is denoted by $\gamma_d(\tau_d) = (V, E)$, where $V = \{P \in \tau_d \mid P \neq \phi, X\}$ and for " $P_1, P_2 \in V$, P_1 adjacent to P_2 or $(P_1, P_2) \in E$ iff $P_1 \cap P_2 \neq \phi$.

Note 1. The underlying space (X, τ_d) is finite discrete topological space throughout this article, even though it is not explicitly stated and $|X| > 1$.

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Analytical solutions and numerical simulation of COVID-19 fractional order mathematical model by Caputo and conformable fractional differential transform method

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Abstract

In this paper, we will discuss an analytical solution and numerical simulation of fractional order mathematical model on COVID-19 under Caputo and conformable sense with the help of fractional differential transform method for different values of η , where $\eta \in (0,1]$. The underlying mathematical model on COVID-19 consists of four compartments, like, the susceptible class, the healthy class, the infected class and the quarantine class. We show the reliability and simplicity of the methods by comparing the solution of given model obtained by FDTM with the solution obtained by CFDTM graphically and numerically.

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ANALYSIS OF MILD SOLUTION OF FRACTIONAL NEUTRAL STOCHASTIC FUNCTIONAL DIFFERENTIAL EQUATIONS WITH RANDOM IMPULSES

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Abstract

In this paper, we study the following fractional order neutral stochastic functional differential equations with random impulses which is given as,

$$\begin{cases} {}^C D_t^\alpha [\vartheta^\alpha(t) - Y(t, \vartheta_t)] = [N\vartheta(t) + z(t, \vartheta_t)]dt + \sigma(t, \vartheta_t)dW(t), & t > t_0, t \neq t_k \\ \vartheta(t_k) = \delta_k(t_k)\vartheta(t_k^-), & \vartheta^\alpha(t_k) = \delta_k(t_k)\vartheta^\alpha(t_k^-), & k = 1, 2, \dots \\ \vartheta_{t_0} = \delta, & \vartheta^\alpha(t_0) = \psi. \end{cases} \quad (1)$$

where $N: D(N) \subset \mathcal{H} \rightarrow \mathcal{H}$ is the infinitesimal generator of a strongly continuous cosine family $\{C(t), t \geq 0\}$. $W(t)$ is a given Q -Wiener process with a finite trace nuclear covariance operator $Q > 0$. t_k is a random variable defined from Ω to $D_k = (0, t_k)$ for $k = 1, 2, \dots$. The aim of the present paper is to study existence and uniqueness of mild solutions of equation (1) by using the non compact measurement strategy and the Mitrch fixed point theorem.

2020 Mathematics Subject Classification: 26A33, 34A12, 34K50, 34K45.

Keywords: fractional derivative and integral, existence of mild solution, random impulses, Itô integrals, measurement of non-compact.

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EXISTENCE AND UNIQUENESS OF SQUARE-MEAN PSEUDO ALMOST AUTOMORPHIC SOLUTION FOR FRACTIONAL STOCHASTIC EVOLUTION EQUATIONS DRIVEN BY G-BROWNIAN MOTION

A.D. NAGARGOJE*, V.C. BORKAR, R.A. MUNESHWAR

ABSTRACT. In this paper, we will discuss existence of solution of square-mean pseudo almost automorphic solution for fractional stochastic evolution equations driven by G-Brownian motion which is given as

$${}^{\circ}D_{\rho}^{\alpha} \Psi_{\rho} = \mathcal{A}(\rho) \Psi_{\rho} d\rho + \Phi(\rho, \Psi_{\rho}) d\rho + \Upsilon(\rho, \Psi_{\rho}) d\langle \mathcal{N} \rangle_{\rho} + \chi(\rho, \Psi_{\rho}) d\mathcal{N}_{\rho}, \rho \in \mathbb{R}.$$

Furthermore, we also prove that solution of the above equation is unique by using Lipschitz conditions and Cauchy-Schwartz inequality. Moreover, examples demonstrate the validity of the obtained main result and we obtain the solution for an equation, and proved that this solution is unique.

AMS Mathematics Subject Classification : 26A33, 34A12, 60H20, 60H10.

Key words and phrases : Fractional derivative and integral, existence and uniqueness, square-mean pseudo almost automorphic, G-Brownian motion, fixed point.

1. Introduction

Some results on the problem of existence and uniqueness of the square-mean pseudo almost automorphic mild solutions for fractional differential equation and stochastic evolution equations driven by G-Brownian motion have been discussed by some authors which can be found in [2, 5, 6, 1, 4]. The main purpose of this article is to discuss the existence and uniqueness of the square-mean pseudo almost automorphic mild solutions for the following stochastic evolution equation of fractional order driven by G-Brownian motion (G-SEEF, in short)

$${}^{\circ}D_{\rho}^{\alpha} \Psi_{\rho} = \mathcal{A}(\rho) \Psi_{\rho} d\rho + \Phi(\rho, \Psi_{\rho}) d\rho + \Upsilon(\rho, \Psi_{\rho}) d\langle \mathcal{N} \rangle_{\rho} + \chi(\rho, \Psi_{\rho}) d\mathcal{N}_{\rho}, \rho \in \mathbb{R}. \quad (1)$$

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Geometric meaning and variation of parameter method of modified α -fractional derivative

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Abstract

In this study, we address a frequently asked topic by scholars, "What is the geometrical meaning of the modified α -derivative", by using the notion of fractional cords. There is also discussion of fractional orthogonal trajectories. We give several examples to explain the notions of fractional cords and fractional orthogonal trajectories. Moreover, we also discuss the variation of the parameter method and we examine how to apply this technique to discover a particular solution to a set of nonhomogeneous linear fractional differential

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ON THE DIVISOR GRAPH OF FINITE COMMUTATIVE RING

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Abstract. In this paper, we introduce a graphical structure of non empty finite commutative ring R called as divisor graph of R , denoted as $D[R]$, is undirected simple graph with vertex set $V = R - \{0, 1\}$ and for distinct vertices $a, b \in V, a \sim b$ if and only if either $a | b$ or $b | a$, i.e. $\exists c \in R$ such that $a = bc$ or $b = ac$. We will discuss structure and properties of divisor graph of ring Z_n . Moreover, we also determine diameter, girth, eulerian, planar, clique number of the $D[Z_n], \forall n$. The main objective of this paper is to study interplay of ring theoretic properties of R with graph theoretic properties of $D[Z_n]$.

Keywords: graph; Eulerian graph; connected graph; girth; clique number; chromatic number.

2010 AMS Subject Classification: 05C25, 05C45, 05C69, 05C07, 05C12.

1. INTRODUCTION

The study of zero divisor graph was initiated by I. Beck[6] in 1988. He introduced graph to commutative ring with vertex set as set of all zero divisors. Then Anderson and Livingston[4] has changed vertex set which was defined by I.Beck[6] and studied the properties of zero divisor

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ANALYTICAL SOLUTIONS OF COVID-19 FRACTIONAL ORDER MATHEMATICAL MODEL BY CONFORMABLE FRACTIONAL DIFFERENTIAL TRANSFORM METHOD

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Abstract

In this paper, we will discuss an analytical solution and numerical simulation of fractional order mathematical model on COVID-19 under conformable sense with the help of conformable fractional differential transform method for different values of order q , where $q \in (0, 1]$. The underlying mathematical model on COVID-19 is consist of four compartments, like, susceptible class, healthy class and infected class, quarantine class. We conclude that use of fractional epidemic model provides better understanding and biologically more insights about the disease dynamics.

1. Introduction

The different models on the CORONA virus disease have been discussed by some authors using the various methods like Adams-Moulton type, Laplace transform coupled with Adomain decomposition method, generalized-Bashforth-Moulton method, q -homotopy analysis transform method which can be found in [1, 2, 3, 4, 5].

2020 Mathematics Subject Classification: 26A33, 37M05.

Keywords: conformable fractional model, COVID-19, numerical simulation, analytical solution, conformable fractional differential transform method.

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Some properties of bases intersection graph-I

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Abstract

In the recent paper Iram Tahleel Jaleel Ahmed, Suryakant M Jogdand , introduced the graphical structure of vector space over a finite field F called as "Bases Intersection Graph" and discussed some basic properties of it. In the present paper, we continue the study of bases intersection graph $I_b(V)$ over a finite field F regarding some important properties. It is shown that the graph is regular graph, Eulerian graph etc. Further it is shown that graph

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Some results on the open subset intersection graph of a product topological space

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Abstract

In the recent paper, R. A. Muneshwar et al., introduced a graph structure called open subset intersection graph $\gamma(\tau)$ on a topological space (X, τ) . In this paper, we study some important results of a graph $\gamma(\tau)$ of a product topological space $(X \times Y, \tau)$. We also determine relationship between diameter, girth, clique number, chromatic number, domination number etc. of an open subset intersection graph of a topological space $(X \times Y, \tau)$, (X, τ_x) and (Y, τ_y) . Moreover, we proved that, if (X, τ_x) and (Y, τ_y) are discrete topological space then $\alpha(\gamma(\tau_x \times \tau_y)) = \alpha(\gamma(\tau_x)) + \alpha(\gamma(\tau_y)) - 2$ and $\chi(\gamma(\tau_x \times \tau_y)) = \chi(\gamma(\tau_x)) + \chi(\gamma(\tau_y)) - 2$ and

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Research Article

Simulation of Fractional Order 2D-Mathematical Model Using α -Fractional Differential Transform Method

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Abstract: In this paper, we will introduce a well-known transformation technique, the modified α -fractional differential transform, to the differential equation of fractional order. We derive some new results with proof using new techniques that never existed before. By using this new technique, we are attempting to solve the nonlinear fractional-order mathematical epidemic model. Furthermore, the fractional epidemic model's solution obtained by using this new technique is correlated with the solution of the same model calculated for a different fractional order by the modified α -fractional differential transform method. Moreover, using the Python software, we can numerically and graphically represent the solution of fractional differential equations.

Keywords: fractional differential transform method, fractional differential equation, conformable fractional differential transform, α -fractional derivative

MSC: 26A33, 49M27, 34A05


1. Introduction

In recent decades, the theory of fractional derivation has gained prominence in mathematical studies. There is no standard form of fractional derivative definition. But the definitions that are most widely used are those that employ integration: The definitions of Riemann-Liouville and Caputo are found in [1].

Here, these fractional derivatives lack several properties, including an algebra of derivatives and mean value theorem (MVT). To avoid some of these and other issues, Khalil et al. [2] proposed a new concept of fractional derivative and demonstrated some outcomes using his new fractional derivative definition, which can be found in [3-10]. In [11], Almeida et al. proposed the limit definition of a fractional derivative. He also used his definition of fractional derivatives to draw several significant conclusions about fractional derivatives. This study's main objective is to offer a limited definition of a fractional derivative that adheres to traditional concepts. For undefined and unexplained concepts and terms, readers can see [12-14].

The fractional differential transform method (FDTM) is one of the numerical methods, and it is used to determine the solution to various differential equations. Zhou [15] first introduced the concept of the differential transform method (DTM), and by using this new DTM method, he solved linear as well as nonlinear initial value problem (IVP) in electrical science. Recently, to solve fractional differential equations, a novel analytical method known

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A DETAILED STUDY OF A NON-LINEAR MECHANICAL OSCILLATOR AND THE
EXPLORATION OF CHAOTIC CHARACTERISTICS

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ABSTRACT

Many mechanical systems appear to be very simple and deterministic, but within certain ranges of parameters, systems can exhibit extremely complicated and unpredictable behavior. In this paper, we have considered a simple pendulum subject to damped and sinusoidal driven force as a mechanical system and discussed its oscillations under certain ranges of parameters. We have analyzed the nature of fixed and periodic points, and by means of period doubling phenomenon, we have proved that the oscillations become chaotic as the parameters are varied.

Keywords: Chaos, dynamical system, nonautonomous system, stability, critical points, almost linearity, period doubling.

Mathematics Subject Classification: 37, 37C, 37C05, 37C1.

1. Introduction

Most of the phenomenon taking place in nature is observed to be nonlinear, extremely complex and depending upon so many parameters which are difficult to control. The mathematical modelling of such phenomenon has been a tough challenge before scientists all over the world. In this regard, the theory of difference equations and differential equations are extremely useful. Getting exact solution of such nonlinear equations is quite a big challenge, and most of the times, we use approximations to the solutions using numerical techniques. However, very small errors in the initial conditions can lead to false or very strange conclusions, which are termed as 'Butterfly Effect'. The kind of strange property of nonlinear systems [4] is also termed as chaos [1, 5]. In the coming sections we will consider a damped driven pendulum as a mechanical system and study its oscillations for different values of the damping and driving forces.



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On Existence of Period Three Orbit and Chaotic Nature of a Family of Mappings

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Abstract - The occurrence of dynamical systems is observed in all branches of sciences like differential equations, Biological sciences, Physical sciences Mechanics, Economics and many more. On a broad spectrum, a dynamical system can be classified in to two categories viz. continuous and the discrete. As a discrete dynamical system, many mathematicians have extensively studied the one parameter family of functions; specially the logistic family $F_n(x) = \mu x(1-x)$, the Tent family, Quadratic family, etc. In last few decades, the chaotic nature of many non-linear phenomenon has been a topic of great interest for the researchers all over the world. The occurrence of chaotic regime for certain values of the parameter in case of the family of mappings $f_c(x) = x^2 - x + c$ using the phenomenon of the period doubling has been proved by Kulkarni P. R. and Borkar V. C. In this paper, we have proved the existence of the period three orbit in the family of mappings $f_c(x) = x^2 - x + c$ for the parameter value $c = -1.5$ which proves that it is a chaotic map.

Keywords — chaotic behavior, critical points, one parameter family of functions, periodic points, Sarkovskii's theorem.

I. INTRODUCTION

Dynamical systems have been attracting mathematicians, physicists, biologists, all over the world as it has a variety of strange properties and the applicability in all branches of sciences. The concept of chaos has become a topic of keen interest all over the world. Talking roughly, chaos, in mathematical concepts, means predictability along with randomness. Chaotic dynamics is the study of the phenomenon where there is certainty and periodicity for a particular values of the parameters, but as the parameter values go beyond a fixed range, the phenomenon shows a strange pattern which is quite unpredictable. Mathematicians have been trying to give more and more accurate mathematical model of a physical phenomenon and predict the changes that may take place over time.

II. DYNAMICAL SYSTEM AND ASSOCIATED TERMINOLOGY

A dynamical system consists of two parts: a state vector $x \in R^n$, which is a list of numbers and may change as the time passes, and a function $f: R^n \rightarrow R^n$, where the set R^n is called as the set of states or the state space. By means of the function f , one can determine the state of the vector at any position from the current state. This rule is described by the function f . Most of the mathematicians study two types of dynamical systems viz. discrete dynamical system and continuous dynamical system. The exact definitions and a number of examples are given by [1], [2], [3], [4] and [5]. In this paper, we will consider only one dimensional discrete dynamical systems.

Basic ideas in the field of dynamical systems have been introduced in the early text of the references provided in this paper; however, for the convenience of the reader, we introduce some of them in brief.

2.1 Iterations of a function

For a given dynamical system $f: S \rightarrow S, S \subseteq R$, iterations of the function f means the compositions of f with itself.

In general, the k^{th} iteration of f at a point x is the k times composition of f with itself at the point x , denoted by $f^k(x)$. For more details, refer [1] [4], [5], [7].

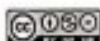
2.2 Fixed Points and Periodic Points

A point x is said to be a fixed point of a function f if $f(x) = x$. If x is a fixed point of f , then $f^n(x) = x$ for all $n \in Z^+$, where Z^+ the set of positive integers.

A point x is said to be a periodic point with period n if there exists a positive integer n such that $f^n(x) = x$. Clearly, if x is periodic with period n , then it is periodic with period $2n, 3n, 4n, \dots$. The smallest n , in this case, is called as the prime period of the orbit. Note that x is a periodic point with period n of f if it is a fixed point of f^n . Refer [1] [4], [5], [7] for more details.

2.3 Attracting and Repelling Fixed Points

Let p be a fixed point of a dynamical system $f: S \rightarrow S, S \subseteq R$.



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Some More Properties of One Dimensional Quadratic Family of Mappings

$$f_c(x) = x^2 - x + c$$

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ABSTRACT

While studying the fluctuations in the population of some species, R. M. May and others in 1974 verified the features of the logistic family $F_\mu(x) = \mu x(1-x)$, where μ is a parameter, and later, it was proved that the logistic mapping undergoes the period doubling phenomenon which is a route to chaos. It has already been proved that the one dimensional family of quadratic mapping $f_c(x) = x^2 - x + c$, where c is a parameter, is also a chaotic mapping. In this paper, we have explored some more properties of the family of quadratic mappings $f_c(x) = x^2 - x + c$ in reference to Schwarzian derivative.

Keywords: fixed points, periodic points, critical points, one parameter family of functions, Schwarzian derivative

Mathematics Subject Classification: 37, 37C, 37C05, 37C1.

1. Introduction

The topic of *dynamical systems* and *chaos* have become the most attracting interdisciplinary subject of interest of the researchers all over the world although the subject began in the mid of the sixteenth century with the invention of differential equations by Newton. With the aid of differential equations, the two-body problem of finding the orbit of earth around the sun was solved, but solving the three-body problem is still a big challenge before the scientists. Many mathematicians like Henry Poincare, Van der Pol, Littlewood, Birkhoff, Lorenz, etc. made important contributions in the development of the theory of dynamical systems and chaos. Very strange and unpredictable patterns



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ON SOME SPECIAL FEATURES OF THE HENON MAPPING

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ABSTRACT

In this paper we have studied Henon map as a two dimensional discrete non-linear dynamical system. We have studied some special features of the Henon mapping. We have obtained the fixed points as well as the periodic orbits of the Henon map and obtained some results regarding their stability. Also, we have obtained the graphs of the iterates for different initial conditions and shown the presence of the chaotic attractor for different parameter values.

KEYWORDS: Dynamical system, Henon map, fixed points, periodic orbits, strange attractor, chaos

1. INTRODUCTION

An unpredictable and very strange dynamics is observed in very complex dynamical systems [3, 4, 6] appearing in nature can also be observed in very simple nonlinear dynamical systems. The simplest of such dynamical systems is the tent function [2, 5] $T_\mu(x)$ defined on the unit interval $[0, 1]$ by

$$T_\mu(x) = \begin{cases} \mu x & 0 \leq x \leq \frac{1}{2} \\ \mu(1-x) & \frac{1}{2} \leq x \leq 1 \end{cases}$$

where μ is a parameter with $0 \leq \mu \leq 2$. Many authors have proved that the tent mapping has a period three cycle [7, 9] given by $(\frac{1}{7}, \frac{2}{7}, \frac{4}{7})$ for $\mu = 2$. The existence of period 3-cycle is one of the indications of the chaotic phenomenon [10, 12]

In this paper we will point out some of the important features of the Henon map. The Henon map was discovered by the French astronomer Michel Henon in 1975 who showed that a strange attractor can also be found in a two dimensional quadratic mapping. The Henon map $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ is defined by $f(x, y) = (1 - \alpha x^2 + y, \beta x)$, where α and β are parameters. If we set $y = 0, \beta = 1$ and $x = t$, then $f(x, y) = f(t, 0) = (1 - \alpha t^2, t)$. Thus the image of the real line under the Henon map is the parabola whose parametric equations are $x = 1 - \alpha t^2, y = t$.

2. FEATURES OF THE HENON MAP

In this section we will study the important features of the Henon map. The next theorem gives us the eigenvalues of the differential [15] of $f(x, y)$.

2.1 Theorem: If $2\alpha x^2 + \beta \geq 0$, then the eigenvalues of the differential $D[f(x, y)]$ of $f(x, y)$ are real and given by $-\alpha x \pm \sqrt{\alpha^2 x^2 + \beta}$. The mapping $f(x, y)$ is area contracting [10, 11] if $0 \leq \beta < 1$

Proof: The Henon map $f: \mathbb{R}^2 \rightarrow \mathbb{R}^2$ is defined by $f(x, y) = (1 - \alpha x^2 + y, \beta x)$, where α and β are parameters. We can write



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An Analysis of a Two Dimensional Continuous Non-Linear Dynamical Systems

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ABSTRACT

The prediction of physical phenomenon commonly observed in nature has been a tough challenge before the scientists and mathematicians all over the world. A careful mathematical modeling of such events has helped to predict the physical state of a system given the current state. Non-linear dynamical systems like mass-spring systems, electrical circuits, chemical reactions, predator-prey models, Lorenz equations, damped driven pendulum, Van der Pol oscillator, and many more have been studied by many mathematicians and physicists and the strange behavior, so called chaos, has been observed in such systems. As an example of a chaotic dynamical system, we have considered the Duffing oscillator, which is an extremely forced and damped oscillator. In this paper, we have analyzed the dynamics of the Duffing oscillator. We have constructed the differential equation of the motion of the Duffing oscillator, obtained its critical points and classified them in reference to their stability. Also, we have obtained the solutions for different initial conditions and different ranges of parameters and concluded that the system exhibits chaotic behavior.

Keywords: Dynamical systems, nonlinear oscillators, equilibrium points, period doubling, chaos.

Mathematics Subject Classification: 37, 37C, 37C05, 37C10, 37C20, 37C25, 37C27, 37C35, 37D, 37G.

1. INTRODUCTION

First we will have a brief discussion and references about the general notions and definitions we will need to understand that come across this paper. Among many definitions of a dynamical system, we prefer a general definition as suggested by Edward R. Scheinerman. [10]

1.1 Dynamical System [10]:

A dynamical system is specified by a state vector $X \in R^n$, which is a list of numbers which may change as time progresses and a function $F : R^n \rightarrow R^n$ which describes how the system evolves over time. A continuous time dynamical system has a state vector $X(t) \in R^n$ and we are given a function $F : R^n \rightarrow R^n$ which specifies how quickly each component of $X(t)$ is changing, i.e., $X'(t) = F(X(t))$, or in brief notation, $X' = F(X)$, which is a system of differential equations.

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SOME ASPECTS OF THE SOLUTIONS OF ROSSLER SYSTEM AND CHAOS

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Abstract. In this paper we have studied the three dimensional non-linear system of differential equations by taking in consideration the two dimensional phase space of the Rossler system. The characteristics of the system are studied in reference to periodic, quasi-periodic and chaotic behavior. The conclusions are supported by means of diagrams of the trajectories obtained in two and three dimensional spaces, strange attractors and bifurcation diagrams.

Keywords: Nonlinear system, trajectories, phase spaces, bifurcation diagrams, strange attractors.

1. INTRODUCTION

A wide range of physical phenomena where there is a change in one quantity that occurs due to a change in one or more quantities can be mathematically modeled in terms of differential equations. Differential equations can be used to describe the motions of objects like satellites, water molecules in a stream, waves on strings and surfaces, etc. In this section we will take a review of some basic terminology associated with a system of differential equations.

1.1 System of Differential Equations [9]

Let $x_1(t), x_2(t), \dots, x_n(t)$ be differentiable functions of a variable t defined on an interval I . Let f_1, f_2, \dots, f_n be functions of x_1, x_2, \dots, x_n and t . Then the set of n

differential equations $X' = F(X, t)$, where $X = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix}$,

$X' = \begin{bmatrix} x_1' \\ x_2' \\ \vdots \\ x_n' \end{bmatrix}$ and $F = (f_1, f_2, \dots, f_n)$ is called as a system

of differential equations. The system where F can depend on the independent variable t is called as a non-autonomous system [2] otherwise an autonomous system which can be written as $X' = F(X)$. The system $X' = F(X, t)$ is said to be linear or non-linear according as the function F is linear or non-linear.

Every solution of the system represents a curve in R^n which is called a trajectory. [3] Trajectories help us to study the qualitative behavior of a system. The function F is also called as a vector field [4]. The vector field always dictates the velocity vector X' for each X . A picture which shows all qualitatively different trajectories of the system is called as a phase portrait. [4]

A linear system of differential equations can be expressed as $X' = A.X$, where A is an $n \times n$ matrix. A theorem concerning the uniqueness of the solution of a linear system is stated as follows.

1.2 Theorem (The Fundamental Existence - Uniqueness Theorem) [6]

Let E be an open subset of R^n containing X_0 and assume that $F \in C^1(E)$. Then there exists an $\alpha > 0$ such that the initial value problem $X' = F(X)$, $X(0) = X_0$ has a unique solution $X(t)$ on the interval $[-\alpha, \alpha]$. The fundamental existence and uniqueness theorem can be also stated as follows. A function $F: R^n \rightarrow R^n$ is said to satisfy Lipschitz condition on a domain $D \subset R^n$ if there exists a constant α such that

$$\|F(X_1 - X_2)\| \leq \alpha \|X_1 - X_2\| \text{ for all } X_1, X_2 \in D$$

If F is continuously Lipschitz then the autonomous system $X' = F(X)$ has a unique solution for an initial point $X(0) = X_0$ in the domain D .

A critical point [10] (equilibrium point, fixed point, stationary point) X_0 is a point that satisfies the equation $X' = F(X) = 0$. If a solution starts at this point, it remains there forever.

A critical point X_0 is called stable critical point of the differential equation $X' = F(X)$ if given $\epsilon > 0$, there is a $\delta > 0$, such that for all $t \geq t_0$, $\|X(t) - X_0(t)\| < \epsilon$ whenever $\|X(t_0) - X_0(t_0)\| < \delta$, where $X(t)$ is a solution of $X' = F(X)$. A critical point that is not stable is called an unstable critical point.

2. THREE DIMENSIONAL SYSTEMS [19]

A three-dimensional linear autonomous system has the form $X' = AX$



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ON SOME EXISTENCE AND UNIQUENESS RESULTS FOR NONLINEAR FRACTIONAL DIFFERENTIAL EQUATIONS WITH BOUNDARY CONDITIONS

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Abstract. In this paper we have discussed a boundary value problem involving Caputo nonlinear fractional integro-differential equations of order $0 < \alpha \leq 1$ and $0 < \beta \leq 1$ with boundary conditions of the form $x(0) = x(1) = 0$. We have proved some new existence and uniqueness results by using the fixed point theory. In particular, we have used the Banach contraction mapping principle and Krasnoselskii's fixed point theorem under some weak conditions. The results proved are supported by means of a couple of examples. *Keywords:* Riemann-Liouville fractional derivative, Caputo fractional differential equation, Banach contraction principle, Krasnoselskii's fixed point theorem

MSC2020-Mathematics Subject Classification: 34B15

1. INTRODUCTION:

After the wide and successful applicability of the theory of differential equations in the fields of Applied Mathematics, Mathematical Physics, Chemical Sciences, Biological Sciences, Engineering and Technology, etc., the theory of fractional calculus has attracted the attention of many researchers because of the applicability of the derivatives and integrals of the fractional order with the corresponding initial and boundary conditions. Besides all the fields of sciences and technology as mentioned earlier, the theory of fractional calculus is being applied to Fluid Dynamics, Electromagnetism, Viscoelasticity, the Analysis of the Feedback Amplifiers and Capacitors, etc. In last few decades, many of the researchers have pointed out that the fractional order differentials and integrals are of special importance in order to describe the viscoelastic properties of the real materials like polymers. In this paper, we have considered the existence and uniqueness of solutions for the following problem:

$$D^\alpha D^\beta x(t) = f(t, x(t), \phi x(t), \psi x(t)), t \in [0, 1] \dots (1)$$

$$x(0) = x(1) = 0$$

where $0 < \alpha \leq 1, 0 < \beta \leq 1, D^\alpha, D^\beta$ are the Caputo fractional derivatives of order α, β

$f : [0, 1] \times R^3 \rightarrow R$ is a continuous function, and

$$\phi x(t) = \int_0^t \lambda(t, s)x(s)ds \dots (2)$$

$$\psi x(t) = \int_0^t \delta(t, s)x(s)ds \dots (3)$$

where $\lambda, \delta : [0, 1] \times [0, 1] \rightarrow [0, +\infty)$ with

$$\phi^* = \text{Sup}_{t \in [0, 1]} \left| \int_0^t \lambda(t, s)ds \right| < \infty \dots (4)$$

$$\psi^* = \text{Sup}_{t \in [0, 1]} \left| \int_0^t \delta(t, s)ds \right| < \infty \dots (5)$$

Before proving the existence of the solution to the boundary value problem (1-5), we will take a review of the basic definitions and the notions required for the understanding of these results in the next section.

2. A REVIEW OF PRELIMINARY CONCEPTS AND RESULTS

Leibnitz discussed the fractional derivative of order 1.5 in his notes to L'Hospital back in the year 1695. Joseph Fourier in 1822 gave an expression for a fractional order derivative [1] obtained from the Fourier integral representation of a function in the form

$$\frac{d^\alpha [f(x)]}{dx^\alpha} = \frac{1}{2\pi} \int_{-\infty}^{\infty} f(\alpha) d\alpha \int_{-\infty}^{\infty} p^\alpha \cos [p(x - a) + \frac{\pi \alpha}{2}] dp$$

The first major study of fractional calculus was made by Liouville in 1833 who gave two definitions of fractional order derivatives as follows. The arbitrary derivative D^ν of order ν of a function $f(x)$ having power series expansion




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NEW EXISTENCE AND UNIQUENESS RESULTS FOR NONLINEAR FRACTIONAL DIFFERENTIAL EQUATIONS WITH COMPOSITE BOUNDARY CONDITIONS

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Abstract :

This paper discusses a boundary value problem of nonlinear fractional integrodifferential equations of order $1 < \alpha \leq 2$, $1 < \beta \leq 2$ and $1 \leq \gamma \leq 2$ and boundary conditions of the form $x(0) = x(1) = D^\beta D^\gamma x(0) = D^\beta D^\gamma x(1) = D^\alpha x(0) = D^\alpha x(1) = 0$. A couple of results ensuring the existence and uniqueness of the solutions is proved by means of the Banach contraction mapping principle and Krasnoselskii's fixed point theorem under some weak conditions. Moreover, two illustrative examples are studied to support the results.

Keywords: Riemann-Liouville fractional derivative, Caputo fractional differential equation, Banach contraction principle, Krasnoselskii's fixed point theorem.

MSC2020-Mathematics Subject Classification:34B15

1.Introduction:

Fractional differential equations are very widely used in many fields of science, technology and social sciences as well. Different variations of the definitions of the fractional order derivative and integration appear in the books by Miller K. S.[1], Podlubny I.[2], ect. The Riemann-Liouville derivative [2- 6] of fractional order α is given by

$$D_t^\alpha [f(t)] = \frac{d^{(m+1)}}{dt^{(m+1)}} \int_a^t (t-\tau)^{-(m+\alpha)} f(\tau) d\tau$$

where $m \leq \alpha < m+1$ and it is assumed that $f(t)$ is defined on the closed interval $[a, t]$ and has the $(m+1)$ th continuous derivative $f^{(m+1)}(t)$. The initial conditions for the Caputo fractional derivative of order α defined by

$${}_a^C D_t^\alpha [f(t)] = \frac{1}{\Gamma(\alpha - n)} \int_a^t \frac{f^{(n)}(\tau)}{(t-\tau)^{n-\alpha+1}} d\tau$$

takes the same form as the integer order derivative and hence it is more utilized in solving the boundary value problems. Agarwal et al.[7] have considered the initial value problem of fractional neural functional differential equation given by

$$D_t^\alpha [x(t) - f(t, x_t)] = f(t, x_t), \quad t \in (t_0, \infty), t_0 \geq 0$$

$$x_{t_0} = \phi$$

with the assumption that D_t^α is the Caputo fractional derivative of order α , $0 < \alpha < 1$, f and g are functions defined on $[t_0, 1) \times C([-r, 0], \mathbb{R}^n) \rightarrow \mathbb{R}^n$, $\phi \in C([-r, 0], \mathbb{R}^n)$, $\alpha > 0$. The authors have proved the existence of the solution to the initial value problem by using the fixed point theorems. Fang Li[8], Ahmad et al.[9, 10], Wang et al. in [11-28] have also considered different types of fractional differential equations with mixed boundary conditions and obtained the existence and uniqueness results for the solutions of the problems.

In this paper, we have considered the existence and uniqueness of solutions to the initial value problem

$$D^\alpha D^\beta D^\gamma x(t) = f(t, x(t), \phi x(t), \psi x(t)), t \in [0, 1]$$

$$x(0) = x(1) = D^\beta D^\gamma x(0) = D^\beta D^\gamma x(1) = D^\alpha x(0) = D^\alpha x(1) = 0 \dots (1)$$

Solution of Fractional Order Differential-Difference Equation by Using Laplace Transform Method.

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Abstract: In this paper, we have proved solution of a non-homogeneous fractional differential-difference equation of a general fractional order α and difference order 1 with general initial conditions with the help of Laplace Transform where the fractional derivative we are using is in accordance with the definition of fractional derivative as Caputo fractional derivative. A few examples are illustrated that support the results. The theorem is proved on the solution of fractional order Differential difference equation. The existence and uniqueness of solution is given by existence of Laplace transform.

Keywords: Caputo fractional derivative, difference Equation, Laplace transform, differential-difference equation
MSC2020-Mathematics Subject Classification:34B15:

1. Introduction:

Fractional differential equations are very useful for modelling

Kamble, et al. [14] proved existence and uniqueness of solutions for the following equation

$$D^\alpha D^\beta x(\tau) = f(t, x(\tau), \phi x(\tau), \psi x(\tau)), \tau \in [0, 1], x(0) = x(1) = 0$$

where $0 < \alpha \leq 1, 0 < \beta \leq 1, D^\alpha, D^\beta$ are the Caputo fractional derivatives of order $\alpha, \beta, f: [0, 1] \times R^3 \rightarrow R$ is a continuous function, and $\phi x(\tau) = \int_0^\tau \lambda(\tau, s)x(s)ds, \psi x(\tau) = \int_0^\tau \delta(\tau, s)x(s)ds,$

$$\lambda, \delta: [0, 1] \times [0, 1] \rightarrow [0, +\infty) \text{ with } \phi^* = \text{Sup}_{\tau \in [0, 1]} \left| \int_0^\tau \lambda(\tau, s)ds \right| < \infty \text{ with}$$

$$\psi^* = \text{Sup}_{\tau \in [0, 1]} \left| \int_0^\tau \delta(\tau, s)ds \right| < \infty.$$

In [15], Kamble, et al. have proved the existence and uniqueness of solutions to the initial value problem

$$D^\alpha D^\beta D^\gamma x(\tau) = f(t, x(\tau), \phi x(\tau), \psi x(\tau)), \tau \in [0, 1] \quad x(0) = x(1) = D^\beta D^\gamma x(0) = D^\beta D^\gamma x(1) = D^\gamma x(0) = D^\gamma x(1) = 0, \text{ where}$$

$1 < \alpha \leq 2, 1 < \beta \leq 2$ and $1 \leq \gamma \leq 2, D^\alpha, D^\beta, D^\gamma$ represent the Caputo fractional derivatives of order α, β and γ respectively, $f: [0, 1] \times R^3 \rightarrow R$ is a continuous function, and

$$\phi x(\tau) = \int_0^\tau \lambda(\tau, s)x(s)ds,$$

$$\psi x(\tau) = \int_0^\tau \delta(\tau, s)x(s)ds$$

$$\phi^* = \text{Sup}_{\tau \in [0, 1]} \left| \int_0^\tau \lambda(\tau, s)ds \right| < \infty, \psi^*$$

$$= \text{Sup}_{\tau \in [0, 1]} \left| \int_0^\tau \delta(\tau, s)ds \right| < \infty$$

$$\lambda, \delta: [0, 1] \times [0, 1] \rightarrow [0, +\infty).$$

2. Differential-Difference Equation

An equation which contains the derivatives of an unknown function and some of its derivatives at arguments which differ by a fixed number of values is called a differential-difference equation. The differential order of a differential-difference equation is the order of the highest derivative and the difference order is one less than the number of distinct arguments appearing in the differential-difference equation.

Sugiyama S.[16] has considered the differential-difference equation

$$x'(t) = f[t, x(t), x(t-1)], t \in [0, t_0]$$

with the initial conditions $x(t-1) = \psi(t), 0 \leq t < 1, x(0) = x_0$ and has proved the existence of a continuous solution $x(t)$ valid for $0 \leq t \leq \min(t_0, K/M)$, where it is assumed that

COMMON FIXED POINT THEOREM FOR TWO MAPPINGS IN bi-b-METRIC SPACE

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ABSTRACT. In this paper we have used the concept of bi-metric space and introduced the concept of bi-b-metric space. our objective is to obtain the common fixed point theorems for two mappings on two different b-metric spaces induced on same set X . In this paper we prove that on the set X two b-metrics are defined to form two different b-metric spaces and the two mappings defined on X have unique common fixed point.

1. INTRODUCTION.

The Banach Contraction Mapping Principle is very useful theorem. Hence it is very popular tool in solving existence problems in many branches of mathematical analysis. Banach fixed point theorem has many applications inside and outside Mathematics. In 1989, an interesting concept of generalized b-metric spaces was introduced by Bakhtin [2]. In 1993 Czerwik [7] extended the results of b-metric spaces. Many researchers generalized the Banach fixed point theorem in b-metric space. Czerwik [8] 1998 presented the generalization of Banach fixed point theorem in b-metric spaces. The existence and uniqueness theorems in b-Metric Space

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Key words and phrases. Fixed Point of a mapping, b-Metric Space, Convergence in b-Metric Space, Cauchy Sequence, bi-metric space.

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Existence and Uniqueness of Fixed Point for a Mapping in b-Metric Space

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ABSTRACT

The Aim of this paper is to show that unique fixed point exists for a mapping satisfying the generalized contractive type conditions in b-metric space and bi b-metric space. The advantage of our work in comparison with the studies done in b-metric space is that the b metric functions used in the theorem are not continuous.

Keywords: b -metric space, Completeness in b- metric space, Cauchy sequence, fixed point.

1. INTRODUCCION

The Banach contraction Principle is very useful theorem. It is very popular tool in solving existence problems in many branches of Mathematical Analysis. Banach fixed point theorem has many applications inside and outside Mathematics. In 1989, an interesting concept of generalized b metric space was introduced by Bakhtin [2]. In 1993 Czerwik [7] extended the results of b-metric spaces. Many researchers generalize the Banach fixed point theorem in b-metric space. Czerwik [8] in 1998 presented the generalization of Banach fixed point theorem in b-metric spaces. The existence and uniqueness theorems in b-metric space was presented by Agrawal [1]. Suzuki [12] obtained some basic inequalities in a b-metric space and its applications. Boriceanu [4], Mehmet Kir [10] extended the fixed point theorem in b-metric space. Borkar [5] obtained the common fixed point theorem for non-expansive type mapping.

Chopade [6] given common fixedpoint theorems for contractive type mapping in metric space. Roshan [11] obtained common fixed point of four mappings in b-metric space. We want to extend some fixed point theorems in metric space which are also valid in b -metric space.

2. SOME BASIC DEFINITIONS AND PRELIMINARIES

Definition 2.1: Let X be a non-empty set. A function $\delta: X \times X \rightarrow \mathbb{R}$ is called as a metric provided that for all $u, v, w \in X$ we have,

- (i) $\delta(u, v) \geq 0$
- (ii) $\delta(u, v) = 0$ if and only if $u = v$
- (iii) $\delta(u, v) = \delta(v, u)$
- (iv) $\delta(u, v) \leq \delta(u, w) + \delta(w, v)$

A pair (X, δ) is called as metric space.

Definition 2.2: Let X be a non-empty set and $s \geq 1$ be a given real number. A function $\delta: X \times X \rightarrow \mathbb{R}$ is called as a b- metric provided that for all $u, v, w \in X$ we have,

- (i) $\delta(u, v) \geq 0$
- (ii) $\delta(u, v) = 0$ if and only if $u = v$
- (iii) $\delta(u, v) = \delta(v, u)$
- (iv) $\delta(u, v) \leq s[\delta(u, w) + \delta(w, v)]$

A pair (X, δ) is called as b- metric space. Clearly, b-metric space is an extension of usual metric space.

Remark: If $s = 1$, then the b-metric space is a usual metric space.

Example 2.1: If $X = \mathbb{R}$, be the set of all real numbers and $d(u, v) = |u - v| \forall u, v \in \mathbb{R}$ be a usual metric defined on \mathbb{R} , then $\delta(u, v) = (u - v)^2$ is a b-metric on \mathbb{R} with $s = 2$.

COMMON FIXED POINT THEOREM FOR TWO MAPPINGS IN bi-b-METRIC SPACE

Varsha D. Borgaonkar¹, K.L. Bondar, and S.M. Jogdand

ABSTRACT. In this paper we have used the concept of bi-metric space and introduced the concept of bi-b-metric space. our objective is to obtain the common fixed point theorems for two mappings on two different b-metric spaces induced on same set X . In this paper we prove that on the set X two b-metrics are defined to form two different b-metric spaces and the two mappings defined on X have unique common fixed point.

1. INTRODUCTION.

The Banach Contraction Mapping Principle is very useful theorem. Hence it is very popular tool in solving existence problems in many branches of mathematical analysis. Banach fixed point theorem has many applications inside and outside Mathematics. In 1989, an interesting concept of generalized b-metric spaces was introduced by Bakhtin [2]. In 1993 Czerwik [7] extended the results of b-metric spaces. Many researchers generalized the Banach fixed point theorem in b-metric space. Czerwik [8] 1998 presented the generalization of Banach fixed point theorem in b-metric spaces. The existence and uniqueness theorems in b-Metric Space

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Fixed Point Theorem in b_2 - Metric Space

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1

Abstract

In this Paper we have used the concept of b_2 - metric space. Our aim is to obtain the common fixed point theorems for a mapping in b_2 - metric spaces. We obtained some fixed point results for the mappings satisfying the contractive type conditions in the b_2 metric spaces. An example is given to verify the main result.

Keywords. Fixed Point, 2 - Metric Space, 2 - Metric Space, Convergence in 2 - Metric Space, Cauchy Sequence, 2-ball.

AMS Classification 47H10, 54H25.

1 Introduction.

Fixed Point Theory is used to discuss the existence and uniqueness of solutions of many problems generated in different branches of Science. Banach Fixed Point Theorem is an essential tool to discuss the existence and uniqueness of fixed point for the mappings in metric spaces. Banach Contraction Principle is not applicable for the discontinuous mapping. Kannan in 1986 generalized the Banach theorem. He proved the existence of solutions for the contractive type mapping which are not continuous. After Kannan's result, many Mathematician's generalized Banach fixed point theorems. In 1989, Bakhtin [2] introduced the concept of generalized metric space called as





DATA ACQUISITION THROUGH NEURAL SENSORS (MEA) SHARED VIA PICONET

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AUTHORS' CONTRIBUTIONS

Author MT was responsible for conception and design, acquisition of data, author VAJ performed analysis and interpretation of data. Authors MT and VAJ drafted the article and revising it critically for important intellectual content; and both the authors approved the version of paper to be published.

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Original Research Article

ABSTRACT

The signals circulating between the neurons are accomplished by action potential. These variations of neural activities can be recorded by many different ways. One of the methods to record these variations is by using sensors. These sensors are designed for transferring and recording cellular action potential. The parameter of cellular action potential includes frequency, amplitude, wave shape and velocity. The output of the sensor can be connected wireless up to eight different electronic devices. This help in connecting different application functioning simultaneously instead of singular device utilizing the complete outputs. By using Bluetooth-piconet network technology and embedded microcontroller signals can be received and the data acquisition can be accomplished. All mobile devices and other devices within the range of 10 meters can be connected by employing this technique. This enables sharing the processing power of the connected devices using Bluetooth technique erasing traditional 2 steps. Bluetooth is considered as standardized protocol for transferring and receiving data by means of a 2.4GHz wireless link. It is a safe and sound protocol that suits for short-range, low-power, and low cost wireless transmissions connecting different electronic devices.

Keywords: Action potential; piconet networks; neural activities; signal processing.

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PREDICTION OF GOLD PRICES BY USING ARTIFICIAL NEURAL NETWORKS

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ABSTRACT

This study gives an application of an Artificial Neural Network (ANN) to forecast the future gold prices. An artificial neural network model is used to forecast the future average monthly gold prices per 10 grams in Indian currency by using the Fletcher-Powell Conjugate Gradient, Quasi-Newton, One Step Secant, Levenberg-Marquardt and Scaled Conjugate Gradient Algorithms'. The data analysis is done by MATLAB R2011b software. The best algorithm is chosen by the least value of MSE (Mean Square Error) and RMSE (Root Mean Square Error).

Keywords: ANN, MSE, RMSE, Gold Price, Forecast.

1. Introduction

Gold is a major commodity in the economic and monetary market. India is the major importers of gold among the world. This yellow metal has grabbed a lot of attention for every class of people as investment purpose. Every day, the value of gold is changes and it is beyond regular phenomina. Now a day's people investing in gold owing to huge profit in future, Investors have mainly primary objective that one being it is a hedge against inflation as over a period of time, the return on gold investment is in line with the rate of inflation. Investing in gold has changed over a period of time for traditional ways by buying jewelries to the modern ways to purchasing gold coins and bars or by investing the gold exchange traded fund (Gold ETF). Gold ETF is a financial instrument of mutual funds in nature which is turn invests in gold and these are listed in stock index. From the past onwards, gold has a received the considerable amount of attention in the markets. This attention has made researchers, investors, and activist in the capital market to look for invest and



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REVIEW ARTICLE

Artificial Neural Network an Advanced Tool for Disease Diagnosis: A Review.

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Abstract:

In the era of technology and Artificial intelligence, Artificial intelligence is used in wide sectors. With the rapid uptake of artificial intelligence to make increasingly complex decisions across different industries, As artificial neural networks (ANN), to improve delivery of care at a reduced cost. Applications of ANN to diagnosis are well-known; however, ANN are increasingly used to inform health care management decisions. ANN has been used as part of decision support models to provide health care providers and the health care system with cost-effective solutions to time and resource management. In this article provided seminal review of the applications of ANN to diagnosis of diseases. The wide applicability of the Artificial Neural Network should be used in the diagnosis process of diseases that will be beneficial for patients for reducing human error in diagnosis process.

Key Words: Neural Network, Disease Diagnosis, Health Care.

Introduction:

In the era of technology and Artificial intelligence, Artificial intelligence is used in wide sectors. With the rapid uptake of artificial intelligence to make increasingly complex decisions across different industries, As artificial neural networks (ANN), to improve delivery of care at a reduced cost. Applications of ANN to diagnosis are well-known; however, ANN are increasingly used to inform health care management decisions [1, 2].

A survey of Artificial Intelligence applications in health care reported uses in major disease areas such as cancer or cardiology and artificial neural networks (ANN) as a common machine learning technique [3]. Applications of artificial neural networks (ANN) in health care include clinical diagnosis, prediction of cancer, prediction of length of stay, image analysis and interpretation (e.g. automated electrocardiographic

(ECG) interpretation used to diagnose myocardial infarction, and drug development. ANN has been used as part of decision support models to provide health care providers and the health care system with cost-effective solutions to time and resource management [4]. Artificial intelligence lies at the nexus of new technologies with the potential to deliver health care that is cost-effective and appropriate care in real-time, manage effective and efficient health care delivery and address non-traditional care settings. We provide a seminal review of the applications of ANN to diagnosis of diseases.

Neural Network:

Neural Networks can be defined as "The computational ability of a computer combined with the desirable functions of the human brain".

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SOME STATISTICAL PROPERTIES OF AREA BIASED GENERALIZED UNIFORM DISTRIBUTION

Statistics

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ABSTRACT

In this Paper, the area biased techniques of generalized uniform distribution has been obtained. The distribution has two parameters. The various structural properties of the newly model have been studied. The parameter estimation of area biased generalized uniform (ABGU) distribution by the method of maximum likelihood. And the Fisher information matrix has been discussed. Further, a likelihood ratio test of this distribution has been obtained.

KEYWORDS

Weighted distribution, generalized uniform distribution, Reliability analysis, Entropy, Order statistics, Maximum likelihood estimator, Likelihood ratio test

1. Introduction

The concept of weight distribution is discussed by Fisher (1944). After being modified by C.R.Rao (1965) is a different distribution, in which with a weighty distribution many situations can be resolved. Weighted distribution is used in a variety of research fields related to reliability, environment, engineering and biomedicine. If the weight function looks at the size of one, the weight distribution reduces the size of the average distribution. If the weight function looks at the size of two, the weight distribution reduces the area of the biased distribution. **Patil** and **Ord** (1976) examined the use of weight-bearing statistics related to population and the environment can be found in **Patil** and **Rao** (1978). **Van Driessche** (1986) relevant data related to the extent to chest height from a sample of the above point in color distribution. **Lappi** and **Bailey** (1987), used a randomized distribution of research in the analysis of the ascending data rate of sample size. Recently, **Elsayed et al** (2020) obtained a new area biased **Aradhyans** distribution with application in Cancer data. This is showing a more flexibility than the classical distribution. Characterization of generalized uniform distribution through expectation discussed by **Bhatt** (2014). Characterization of generalized uniform distribution based on lower record values discuss by **Khan** and **khan** (2017). Consider the probability density function (pdf) of generalized uniform distribution is given by $f(x; \alpha, \beta) = \frac{\alpha^{x+1}}{\beta^{x+1}}, 0 \leq x \leq \beta, -1 < \alpha < 1$

And its first and second raw moment

$$E(X) = \frac{\beta(\alpha+1)}{(\alpha+2)}$$

$$E(X^2) = \frac{\beta^2(\alpha+1)}{(\alpha+3)} \tag{1.2}$$

2. AREA BIASED GENERALIZED UNIFORM (ABGU) DISTRIBUTION

Suppose X is a non-negative random variable with probability density function $f(x)$. Let $w(x)$ be the non negative weight function, and then the probability density function of the weighted random variable X_w is given by:

$$f_w(x) = \frac{w(x)f(x)}{E(w(x))}, x > 0$$

Where $w(x)$ is a non-negative weight function and $E(w(x)) = \int w(x)f(x)dx < \infty$.

For different weighted models, we have different choice of the weight function $w(x)$. When

$w(x) = x^c$, the resulting distribution is termed as weighted distribution. In this paper, we have to find the area biased version of weighted distribution, we will take $c = 2$ in weights x^2 , in order to get the area biased distribution and its pdf is given by:

$$f_1(x) = \frac{x^{\alpha+2}}{\beta^{\alpha+2}}, x > 0 \tag{2.1}$$

Using the values of (1.1) and (1.2) in equation (2.1), we will get the pdf of area biased generalized uniform distribution

$$f_1(x) = \frac{x^{\alpha+2}(\alpha+3)}{\beta^{\alpha+3}} \tag{2.2}$$

And the cumulative distribution function of area biased generalized uniform (ABGU) distribution is obtained as

$$F_1(x) = \int_0^x f_1(x)dx$$

$$F_1(x) = \int_0^x \frac{x^{\alpha+2}(\alpha+3)}{\beta^{\alpha+3}} dx$$

After simplification, we will get the cumulative distribution function (cdf) of ABGU distribution is

$$F_1(x) = \left(\frac{x}{\beta}\right)^{\alpha+3} \tag{2.3}$$

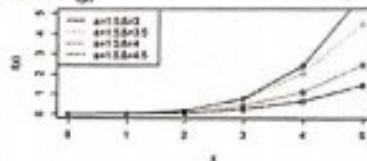


Fig 1. The Probability Density Function of ABGU for the indicated values of α and β .

Asymptotic Behavior:

We seek to investigate the behavior of the proposed model as in equation (2) as $x \rightarrow 0$ and $x \rightarrow \infty$. This model involve considering $\lim_{x \rightarrow 0} f_1(x)$ and $\lim_{x \rightarrow \infty} f_1(x)$.

As $x \rightarrow 0$

$$\lim_{x \rightarrow 0} f_1(x) = \lim_{x \rightarrow 0} \left[\frac{x^{\alpha+2}(\alpha+3)}{\beta^{\alpha+3}} \right] = 0$$

As $x \rightarrow \infty$

$$\lim_{x \rightarrow \infty} f_1(x) = \lim_{x \rightarrow \infty} \left[\frac{x^{\alpha+2}(\alpha+3)}{\beta^{\alpha+3}} \right] = 0$$

These results confirm that the proposed distribution has a mode.

3. Reliability Analysis

In this session, we will introduce the reliability function or survival function, hazard rate function or failure rate and reverse hazard rate function, Mills ratio for the area biased generalized uniform distribution.

3.1 Survival Function

The survival function of ABGU is defined as

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Best Cost Entry Method for the Solution of Transportation Problem

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Abstract:

Transportation problem plays the very important role in the industry, commerce, Economics & logistics for the maximization of the total profit and minimization of the loss of the industries or the organizations. In the general transportation problem solution having the two stages first stage is to be finding the IBFS & apply the optimality test for improves of the solution. General procedure is to time consuming and having the more iteration so avoid the problem the new method is suggested for finding the IBFS of the TP. This method is alternative method for finding the IBFS of the TP.

Keywords:

Operation Research, TP-Transportation Problem, LPP – Linear Programming Problem, VAM-Vogel's Approximation method, Objective function, IBFS- Initial Basic feasible Solution, MODI- Modified Distribution Method.

Introduction:

The transportation problem is one of the subclasses of the linear programming problem. The objective of the transportation problem is to transport the various quantities of the single homogeneous commodity from the sources to the different destinations in the minimum cost. To achieve objective of the transportation problem we must know the amount and quantities for the supplied unit to the different destinations. The transportation problem is the one of the important application of the linear programming problem. In the transportation problem availability of the each sources and amount of the transportation from the particular source to the different destination is known. In the Balanced transportation problem number of the demanded unit is exactly equal to the number of the supplied unit. In the unbalanced TP this condition not satisfied. The main objective of the TP is to minimize the total transportation cost so that the entire rim requirements are satisfied.

In general, let there be 'm' sources of the supply, say $S_i(i=1,2,\dots,m)$ having the $a_i(i=1,2,\dots,m)$ units is to be transported to the different destination $D_j(j=1,2,\dots,n)$ according to the requirement of the each destination $b_j(j=1,2,\dots,n)$. Let C_{ij} Cost of unit transporting from the i^{th} source to the j^{th} destination.

Mathematically the Transportation Problem can state as....

$$\text{Minimize } z = \sum_{i=1}^m \sum_{j=1}^n x_{ij} c_{ij}$$



Modeling of COVID-19 new cases and deaths in top 10 affected countries

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Abstract

Introduction: This study aimed to develop a model utilizing the data from the top 10 countries (as of August 22, 2020) with the maximum number of infected cases. These countries are the United States of America, Brazil, India, Russia, South Africa, Peru, Mexico, Colombia, Chile, and Spain. The model is developed using the newly infected cases, new deaths, cumulative infected cases, and cumulative deaths due to COVID-19 starting from the day on which the first infected cases of COVID-19 in each of these countries is diagnosed to the date August 19, 2020. **Materials and Methods:** This study includes data such as the newly infected cases, new deaths, cumulative infected cases, and cumulative deaths due to COVID-19 starting from the day on which the first infected case of COVID-19 in each of these countries is diagnosed to the date August 19, 2020, in the top 10 most affected countries. The data were obtained from World Health Organization (WHO) website. To fit the data into a regression model, IBM SPSS Statistics 21.0 was used. The linear, logarithmic, quadratic, and cubic curves were fitted to the newly infected COVID-19 cases and daily deaths due to COVID-19. In choosing the best-fitted model, the coefficient of determination (R-square) was used.

Results: Cubic regression model is the best fit model for new infected COVID-19 cases as well as COVID-19 deaths. It has the highest R-square value as compared to the linear, logarithmic and quadratic.

Conclusion: To control the spread of infection, there is a need for aggressive control strategies from the administrative departments of all countries.

Keywords: COVID-19, COVID-19 modeling, cubic model, disease prediction, forecasting, trend analysis

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INTRODUCTION

The novel coronavirus disease-2019 (COVID-19) was first reported on December 31, 2019 in the city of Wuhan,

Hubei Province, China.¹⁴ It is a highly contagious virus that has spread rapidly and efficiently. At present, the domestic outbreak in China has been effectively controlled, whereas the new coronavirus is spreading rapidly in other parts of the world. It started spreading rapidly worldwide and it was declared as a "global pandemic" on March 11, 2020 by the Director-General of the World Health Organization

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(REVIEW ARTICLE)

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A review of human iris identification and recognition using soft computing techniques

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Abstract

Computer vision and iris recognition are fields that are constantly evolving. During the past ten years, there has been a significant increase in the level of interest in computer vision, iris recognition, soft computing techniques, neural networks, etc. This paper reviews different research papers on iris recognition. Lastly, it focuses on the international status of iris recognition.

Keywords: Iris recognition; Computer vision; Faces; AI; Soft computing

1. Introduction

With the development of artificial intelligence (AI) algorithms, human iris identification and recognition systems may gain speed, hardware simplicity, accuracy, and learning ability. Biometrics technology plays an important role in the public security and information security domains. Using various physiological characteristics of humans, such as iris, retina, 2D and 3D faces, facial thermography, fingerprints, hand geometry, etc., biometrics accurately identify each individual and distinguish one from another. Iris recognition entails capturing, preprocessing, and recognizing the iris in a digital eye image. Iris image pre-processing includes iris localization, normalization, and enhancement. Each of these steps uses different algorithms. In the iris localization step, the inner and outer circles of the iris and the upper and lower bounds of the eyelids are determined. The inner circle is located between the iris and pupil boundaries, and the outer circle is located between the sclera and iris boundaries.

The most recent analysis space in the Human Iris Image Process is Human Iris Identification and Recognition, and this can be a difficult task due to matching in the presence of outliers and noise. Recognition of geometrically remodeled iris images, reading purposeful modification and looking at images in guide information.

2. Review of Literatures

It focuses on iris recognition algorithms and presents the results of 9.1 million comparisons among eye images from trials in Britain, the USA, Japan, and Korea in the present paper [1]. It designed an iris recognition system by using neural networks. The paper contains a study of the average time for iris recognition and the achievement of 98.62% segmentation accuracy. By using vector as the input signal to recognize the iris pattern, the accuracy is 99.25% [2]. The concept of the presented preprocessing method is very efficient, and he has recommended it for further enhancement studies. The study also includes a hardware implementation of a weightless neural network that was successfully developed for an iris recognition system. The performance of the system has been evaluated by the author and found effective and suitable [3]. The core of this paper is a study of the comparative performance of four different approaches

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Article

Layer-by-Layer Immobilization of DNA Aptamers on Ag-Incorporated Co-Succinate Metal–Organic Framework for Hg(II) Detection

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Abstract: Layer-by-layer (LbL) immobilization of DNA aptamers in the realm of electrochemical detection of heavy metal ions (HMIs) offers an enhancement in specificity, sensitivity, and low detection limits by leveraging the cross-reactivity obtained from multiple interactions between immobilized aptamers and developed material surfaces. In this research, we present a LbL approach for the immobilization of thiol- and amino-modified DNA aptamers on a Ag-incorporated cobalt-succinate metal–organic framework (MOF) (Ag@Co-Succinate) to achieve a cross-reactive effect on the electrochemical behavior of the sensor. The solvothermal method was utilized to synthesize Ag@Co-Succinate, which was also characterized through various techniques to elucidate its structure, morphology, and presence of functional groups, confirming its suitability as a host matrix for immobilizing both aptamers. The Ag@Co-Succinate aptasensor exhibited extraordinary sensitivity and selectivity towards Hg(II) ions in electrochemical detection, attributed to the unique binding properties of the immobilized aptamers. The exceptional limit of detection of 0.3 nM ensures the sensor's suitability for trace-level Hg(II) detection in various environmental and analytical applications. Furthermore, the developed sensor demonstrated outstanding repeatability, highlighting its potential for long-term and reliable monitoring of Hg(II).

Keywords: DNA aptamers; metal–organic frameworks; layer-by-layer immobilization; electrochemical sensors; heavy metal ions



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1. Introduction

Heavy metal ions (HMIs) are pervasive environmental pollutants known for their detrimental health effects and ecological consequences [1,2]. Heavy metals can enter the environment through industrial discharges, agricultural runoff, mining, and even natural erosion, and they tend to accumulate in soils, water bodies, and the food chain [3–5]. This persistence can lead to the bioaccumulation of heavy metals in living organisms, posing severe health risks to humans and wildlife. The development of advanced and sensitive detection methods for HMIs is of paramount importance to mitigate these concerns. Electrochemical sensors, with their high sensitivity and selectivity, have emerged as a promising avenue for HMI detection [6].

MOFs as electrode modifiers enhance HMI detection due to high surface area, tunable pores, and functionalizable structures [7–12]. MOFs offer a versatile and promising platform for HMI detection, contributing to environmental protection, public health, and safety by providing highly sensitive, selective, and rapid detection methods. Researchers continue to explore and develop new MOF-based materials and sensor designs to address

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Nitrocellulose-Passivated SnO₂ Thin Film as a Ultraviolet-C Photodetector

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This study demonstrates the development of an ultraviolet (UV)-C photodetector (PD) fabricated using a surface-passivated SnO₂ thin film deposited via spray pyrolysis. This PD possesses an unprecedentedly fast response speed, with both rise time and decay time of 0.3 ms. Furthermore, even when subjected to a modest UV light intensity of 6 $\mu\text{W cm}^{-2}$, the device shows a significantly high responsivity of 1500 A W⁻¹, external quantum efficiency of $7 \times 10^3\%$, and detectivity of 10¹³ Jones. When compared to previously reported SnO₂-based PDs, this device exhibits consistent performance over a long working time, which may be due to the suppression of surface vacancy defects via surface passivation, as observed from structural and optical measurements. This type of PDs has the potential to be useful in wide range of applications, including industrial sensing, medical diagnostics, and environmental monitoring.

1. Introduction

Photodetector (PD) is a vital device that detects light signals and has attracted significant research interest due to its applications in communication, healthcare, monitoring, sensing, and other fields.^[1-4] In healthcare, for example, potentially harmful ultraviolet-C (UV-C) radiations from the Sun reaching the Earth's surface can cause acute and chronic health effects on humans, affecting their skin, eyes, and immune system.^[5] UV-C radiation is generally absorbed in the Earth's atmosphere and does not reach the surface, but ongoing ozone depletion allows it to reach the Earth's surface.^[6,7] As a result, there is a growing interest in developing PDs specially designed for

UV-C detection. To mitigate interference from solar radiation,^[7,8] such detectors primarily rely on wide bandgap semiconductors such as SiC,^[9] GaN,^[10-14] α -MoS₂-decorated p-AlGaIn/n-GaN nanowires,^[15] NdNb₂O₇,^[16] MoO₃,^[17] TiO₂,^[18] etc. Wide bandgap semiconductors such as TiO₂,^[19] ZnO,^[20] and SnO₂^[21] are emerging as promising and cost-effective materials for UV-C detection in recent research. They are also preferred because of their exceptional chemical and physical stability.^[21-24] These inherent properties of metal oxide materials make them ideal candidates for the development of UV-C PDs, thereby contributing to the development of robust and economically viable UV radiation monitoring technologies.

SnO₂ is a wide bandgap (3.6 eV) semiconductor that is well-known for its unique optical transparency in the visible range and electrical resistivity in the range 10⁻⁴-10⁸ $\Omega\text{ cm}$.^[25] These properties are caused by the concentration of oxygen vacancy defects in bulk and surface region.^[26] When these films are used in photodetection applications, the adsorption/desorption of atmospheric oxygen on/from surface vacancy defects in SnO₂ films plays a key role in modulating photoconductivity, resulting in an increase in response time of SnO₂-based PDs.^[26] This can be avoided by growing the material in a controlled manner, but it is obviously impossible.

In this study, we present an oxygen adsorption-free UV PD with high photoresponsivity, external quantum efficiency (EQE), detectivity, and an extremely fast response time. The device is engineered by surface passivating a spray-synthesized SnO₂ thin film with nitrocellulose (NC). The observed enhancement in PD performance can be attributed to the concealed surface traps induced via surface passivation, which avoids electron trapping and reduces the recombination of electron-hole pairs.

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Waste to Wealth: Upcycling Waste Toner into Magnetic Fe₃O₄ and Conducting Polymer Hybrids for Enhanced Energy Storage Application

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Abstract

Printers generate electronic waste in the form of used ink cartridges, which has an impact on resources such as plastics and precious metals. Toner metal oxide repurposed for supercapacitors could save valuable materials. Figuring out the optimal electrolyte concentration, on the other hand, is critical for optimizing supercapacitor performance and increasing energy/power density. This paper investigates the characteristics of waste toner-derived Fe₃O₄ and its composite with two conducting polymers, i.e., polyaniline (PANI) and polypyrrole (PPy) as electrode materials. With studies performed in 2 M, 4 M, and 6 M KOH electrolyte, a comparative analysis is made to understand the effect of electrolyte concentration on supercapacitor performance linked to the enhanced performance. The highest specific capacitance was achieved in 4 M KOH electrolyte which was calculated to be 319 F/g and 286 F/g at 10 mV/s composite synthesized with PPy and PANI, respectively, in a three-electrode assembly. The supercapacitor device performed well in terms of energy density and power density when tested in a Swagelok cell assembly. These outcomes offer significant insights into the potential of waste-derived materials for sustainable energy devices, implying a promising future for energy storage applications.

Pranav M. Jambhale and Vijaykiran N. Narwade have contributed equally.

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High-performance blue light photodetector based on PANI/CdS heterojunction

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ABSTRACT

The pursuit of innovative and enhanced p-n junction photo-diodes for application in optical, optoelectronic, and microelectronic devices has become a global research focus. These diodes' fundamental operation hinges on exploiting disparities in band gaps and electronic structures of constituent materials, thereby enabling the rectification of electrical current, permitting it to flow in a single direction. In this study, we present the design and fabrication of a high-performance blue light photodetector, which uses an n-type cadmium sulfide (CdS) thin film and a p-type polyaniline (PANI). The PANI/CdS heterojunction photodetector demonstrates exceptional performance characteristics, achieving a responsivity of approximately 32 mA/W, a detectivity of approximately 4×10^{13} Jones, and a sensitivity of 5.9×10^6 % under blue light illumination at an applied bias of 30 V. Furthermore, this photodetector exhibits a remarkable rectification ratio of 78 and an impressively short response time of 60 μ s. The outstanding performance attributes, including rapid response speed and rectification behavior, are attributed to the surface passivation of the CdS material and PANI chain and CdS linkage mediated states, which effectively reduces the dark current. This process enhances the efficient and rapid transport of photo-generated carriers, whereas, the interfacial nature concurrently reducing photocurrent during reverse bias conditions, thus facilitating the observed rectification effect. This research presents a significant advancement in the area of high-performance photodetectors, holding promise for a multitude of applications across optical, optoelectronic, and microelectronic devices.

1. Introduction

Photodetectors with consistent and high-performance characteristics are indispensable components in numerous advanced technologies, spanning terrestrial applications to industrial sectors [1]–[5]. In the past, traditional semiconductor materials like silicon, indium gallium arsenide, and germanium dominated the photodetector section [6]. While these semiconductors offer exceptional photosensitivity, they come with significant drawbacks, including high production costs, demanding high-temperature processing, limited compatibility with flexible substrates, restricted spectral range, and a requirement for

cryogenic cooling to ensure efficient operation [7]. As a result, there is a growing interest in identifying novel materials that can serve as the foundation for high-performance semiconductors [1]–[5].

Photodetectors based on heterojunction systems, such as metal oxide semiconductors, rely on the concept of altering conductivity through interaction with radiation (photons). Heterojunction photodetector acquire distinctive advantages including fast response speed, high responsivity and spectrum specificity, as it usually separates the photo-generated electron-hole pairs efficiently [8]. However, based on the physical properties of semiconducting material used they often exhibit limited sensitivity to specific target radiation, leading to photon

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Highly sensitive, selective, repeatable and flexible chemiresistive NO₂ sensor based on reduced graphene oxide/free based porphyrin composite

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ABSTRACT

A highly sensitive and selective nitrogen dioxide (NO₂) sensor has been developed using reduced graphene oxide (rGO)/5-(4-Methoxycarbonylphenyl)-10,15,20-triphenyl-21H,23H-porphine (MCPTPP) composite. The rGO was prepared by thermal reduction of graphene oxide (GO), which was synthesized via an improved Hummer's method. Using a drop-casting technique, the rGO/MCPTPP composite was deposited on an Indium Tin Oxide (ITO) flexible electrode. Various rGO/MCPTPP composites were developed by varying MCPTPP concentrations. A range of characterization tools confirmed the successful synthesis of the materials. The rGO/MCPTPP_1:3 composite exhibited high sensitivity, rapid response, and a recovery time of 31s. and 81s. respectively when exposed to 250 ppm NO₂ at room temperature (RT). The sensor demonstrated good repeatability, excellent 60-day stability, and linearity from 50 to 500 ppm of NO₂ concentration. The developed flexible chemiresistive sensor displayed excellent selectivity for NO₂ among all the tested gases. The significant enhancement in NO₂ sensing performance is attributed to the synergistic effect between rGO and MCPTPP. This work highlights the potential of the rGO/MCPTPP composite for sensitive and selective chemiresistive detection of NO₂, making it promising for environmental monitoring and chemical industry applications.

Abhaysinh S. Khune and Rameshwar P. Bongane have contributed equally to this work.

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Full Length Article

Enhanced CO sensing with highly sensitive and selective rGO-Ru OEP chemiresistive sensor

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ABSTRACT

The escalating discharge of noxious gases resulting from unmitigated anthropogenic activities has emerged as a pivotal concern, presenting imminent threats to global ecosystems. In response to this pressing challenge, the development of cutting-edge materials within gas sensor systems emerges as a promising avenue for the precise detection of hazardous gaseous pollutants. This investigation delves into the synthesis and characterization of a novel composite material: reduced graphene oxide (rGO) modified with ruthenium Octaethyl porphyrin (Ru OEP), with a primary focus on its chemiresistive sensing properties. The meticulously deposited rGO-modified Ru OEP material onto gold microelectrodes, featuring a 3 μm gap on a silicon Si/SiO₂ substrate, resulted in an intricate two-terminal chemiresistive sensor device. Comprehensive structural, spectroscopic, and morphological analyses were conducted to elucidate the intricacies of the composite material. The electrical characterization, evaluated through I-V measurements, provided nuanced insights into the device's resistance properties. Notably, the chemiresistive sensor demonstrated exceptional responsiveness to Carbon monoxide (CO) gas, exhibiting an impressively low limit of detection (LOD) at 2.5 ppm. The fabricated sensor showcased rapid response and recovery times, registering at 43 s and 65 s, respectively, underscoring its efficiency in real-time applications. Furthermore, the sensor maintained linearity and stability across a broad spectrum of conditions, ensuring prolonged reliability and consistent performance. This research underscores the potential of advanced materials, specifically the rGO-modified Ru OEP composite, in crafting highly effective gas sensors to address urgent environmental and safety concerns. The presented findings contribute invaluable insights to the burgeoning field of gas sensor technology, paving the way for innovative solutions to mitigate the adverse impacts of anthropogenic activities on our delicate ecosystems.

Introduction

Unplanned development and industrialization have damaged air, water, and land quality. It also affects the environment and living creatures [1]. Many people have died due to the consequences of the nightmare mentioned above. The condition of living creatures in India is the result of some tragedy, for example, the Bhopal disaster was one of human history's worst and most devastating accidents [2]. The Viala-khaptram gas leak (May 2020) was an industrial disaster that disturbed

the lives of many individuals. Many toxic gases in the atmosphere, such as SO₂, CO₂, NH₃, CO, and others, are created due to uncontrolled pollution, predominantly due to the spreading of poisonous tentacles across ecosystems by industries [3–6]. Carbon monoxide (CO) is odorless, colorless, and exceptionally noxious to living beings. It is less dense than air and can be obtained from natural and artificial sources. Gases, charcoal and wood-burning stoves, water heaters, industrial sources, lanterns, smoke, and generators (foundries, mills, etc.) all produce CO [7]. Exposure to CO beyond permissible exposure limit

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Reduced graphene oxide (rGO) and 5, 10, 15, 20-tetra-p-tolyl-21H, 23H-porphine (TPTP) composite: highly reproducible and repeatable chemiresistive SO₂ sensor

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Abstract

In the current study, a chemiresistive SO₂ sensor based on a composite of reduced graphene oxide (rGO) and 5, 10, 15, 20-tetra-p-tolyl-21H, 23H-porphine (TPTP) was developed and extensively studied. Improved Hummers methods were used to synthesize graphene oxide (GO), and a thermally heating bottom-up approach was used to reduce GO to rGO. Gold electrodes were thermally coated on the transparent sheet using a thermal evaporator. The composite of rGO/TPTP was synthesized using a simple chemical method. Structural, morphological, spectroscopic, electrical, and optical studies were carried out using X-ray diffraction, atomic force microscopy, field emission scanning electron microscopy, Fourier-transfer infrared spectroscopy, Raman spectroscopy, current–voltage, and UV–vis spectroscopy, respectively. The sensing response of rGO/TPTP for various concentrations of sulfur dioxide (SO₂) was investigated in chemiresistive modality. The rGO/TPTP composite chemiresistive sensor displayed exceptional performance, with a consistent response spanning 1 ppm to 10 ppm. It exhibited outstanding repeatability, linearity, stability, and boasted an impressive limit of detection (LOD) of 1 ppm. This LOD is significantly lower than the recommended permissible exposure limit (PEL) of 5 ppm set by OSHA (Occupational Safety and Health Administration), USA. The sensor based on the rGO/TPTP composite exhibited a very fast response and recovery time of 33 s. and 27 s. respectively.

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Science College, Nanded



Bifunctional Supercapacitor and Photocatalytic Properties of Cuboid Ni-TMA MOF Synthesized Using a Facile Hydrothermal Approach

Vijaykiran N. Narwade¹ · Ganesh K. Rahane² · Kashinath A. Bogle³ · Meng-Lin Tsal⁴ · Sachin R. Rondiya² · Mahendra D. Shirsat^{1,5}

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Abstract

Metal-organic frameworks (MOFs) with a substantial surface area and configurable porosity have gained the interest of researchers in energy storage devices and environmental management. Our investigation efficaciously employs a cuboid-shaped nickel and trimesic acid metal-organic framework (Ni-TMA MOF) as a bifunctional high-performance supercapacitor electrode as well as an efficient photocatalyst. The Ni-cuboid-like MOF's structure provides more electroactive sites along with a shorter pathway for electron transfer and electrolyte diffusion, resulting in a high specific capacitance of 236 F g^{-1} at 1 A g^{-1} . The fabricated electrode exhibits particularly high capacitance retention, with over 98% retention even after 1000 cycles. The photocatalytic activity of the Ni-TMA MOF for the degradation of rhodamine 6G dye was investigated, which revealed that 90% of the dye was degraded in nearly 40 min, which follows the modified Freundlich process. The development of multifunctional materials to address emerging problems is of paramount importance, and this work ensures this possibility, with results showing improved energy storage and photocatalytic capability.

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Telephonic Interview with Gurcharan Das

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Gurcharan Das graduated from Harvard University where he studied philosophy with John Rawls and Sanskrit under Daniel Ingalls. He later became CEO of Procter and Gamble but now he has taken voluntary retirement to become a full time author. Telephonic interview is conducted with Gurcharan Das on Sunday, 15th March 2015 at 3:47 p.m. This telephonic interview reveals new information related to the narratives of Gurcharan Das. Below is the full transcript of the telephonic interview.

Researcher: Good afternoon sir, thank you for giving an opportunity to speak with you. I am doing my research on the topic India in the Selected Narratives of Gurcharan Das: A Critical Study. Sir, I have gone through all your works. I watch your interviews and read your blog. After reading your works I got answers to most of the questions I had. Yet there are some questions which need answers from you. So, I request you to answer these questions. With your permission, I would like to start the telephonic interview.

Q: What are your views regarding utility of literature and literary research?

Gurcharan Das: I am very fond of literature. I think literature opens up new dimensions in our life. It allows us to experience in our imagination. Literature also tells what happened to other people. Very often we don't make some of the same mistakes that people make if we read literature. Of course human beings are always making mistakes so literature is not always helpful in that regard. There are certain moral truths which literature can capture far better than say Philosophy can, and so that is why I turned to the *Mahabharata*. The *Mahabharata* is the epic work which is helpful to understand the notion of *dharma*. In *The Difficulty of Being Good*, I have examined many moral emotions such as envy, status anxiety, courage, remorse, revenge and so on. I have given examples from other literary sources to understand these moral emotions. I personally think that literature is very useful. Everyone should read it. You may become richer in thoughts by reading literature. After reading literature you may realize that some thoughts and feelings you have, are not only yours but of others' experience also.

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HIGHER EDUCATIONAL INSTITUTE AS A PLATFORM FOR STARTUP

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Abstract

Indian education system has three basic disciplines Arts, Commerce and Science. Students can opt for any one of these three disciplines so colleges in India have a less opportunities to impart multi-disciplinary knowledge to its students. No doubt specialization in education provides a student an expertise in the concerned domain but the changes due to technology, privatization, liberalization and globalisation have made it essential for him to understand various knowledge sectors all at once. In this scenario, it becomes challenging to launch a suitable support system to initiate Startups from colleges. To respond 'Startup India Programme' by Narendra Modi government, the Ministry of Commerce and Industry put forth a definition of Startup for the first time on D.17th April, 2015. According to, Shri. Suresh Prabhu, the honourable Minister of Commerce and Industry of India, "Startup is the process which starts with a new thinking and commitment to do something different". In this regard, educational institute plays important role to enable students to think differently and to do different things. The Government, Industry and Educational institutes are important actors in an innovation ecosystem for Startup. At the college level teachers can play important part as advisers, mentors and facilitators to create the ecosystem required for entrepreneurship development. The young student can be an unstoppable Indian entrepreneur if he is motivated at the college level where he has full energy and capacity to accept challenges. With their Startups, ambitious students can create jobs. The present research paper will highlight how a higher educational institute can be a better platform for motivating students for Startup. It will also discuss various government policies for entrepreneurship development and the things required for establishing a Startup. It will suggest various ways for empowering girl students for opening their own Startups so that they can contribute for nation's development. As rural development marks nation's development, this paper will focus on some challenges for educational institutions of rural areas to have partnership with industries and setting up support system for entrepreneurship.

Key Words: Startup, higher educational institutes, policy, development, entrepreneurship

Introduction

India has been suffering from the problem of unemployment. Some reasons of the unemployment are large Indian population, compromise to quality education, inadequate infrastructure for education, etc. Moreover the Indian companies are floundering even after more than twenty years of reforms and liberalization. To solve

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A Critical Study of India's Technological Advancement in Gurcharan Das' *India Unbound*

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Abstract: Gurcharan Das (3rd October, 1943) recounts technological history of India in his best seller *India Unbound* (2010). He opines that India has not yet achieved the status of developed nation because in the beginning immediately after India's freedom, Indian business policies did not favoured foreign capital and automatically it has rejected the benefits of technology. Gurcharan Das had written articles in *Times of India* and *Economic Times* on the harmful effects of the Foreign Exchange and Regulation Act of 1974 which denied foreign investments and technology. In *India Unbound*, Gurcharan Das enlists the millions of reforms after liberalization in 1991. He criticizes that technology in the liberal economy has helped to create jobs and new entrepreneurs but this development is not able to eradicate the poverty from India because of the corruption and lack of effective implementation of government policies. This paper has critical analysis of technological advancement of India narrated in *India Unbound*. The research study adopts qualitative research analysis method.

Index Terms - liberalization, technology, industries, entrepreneurship, advancement.

1. INTRODUCTION

Gurcharan Das talks about Indian business which has been growing due to the reforms in economy and technology. He divides India in to two types of major business groups. The newly emerging group is of vibrant world of knowledge-based, globally competitive companies in software, Internet, IT-based industries, generic pharmaceuticals, and entertainment. The second group is of the old family business houses which are sick and dying. It has joint ventures with foreigners. This businesses need protection. The time has come to learn from the foreign partners of Indian companies. Indian industrialist should adopt and adapt the developed foreign technology and managerial skills.

II. CRITICAL ANALYSIS OF TECHNOLOGICAL ADVANCEMENT OF INDIA IN *INDIA UNBOUND*:

ACCORDING TO Das, technology should be taught to a student at school level only. Das shares with readers his own experience when he was in American school he had a class called "shop" where he availed an opportunity to work with lathes, tools, and machines and learn to handle the technology. Gurcharan Das gives examples of technological development in India like National Institute of Information Technology (NIIT) which is one of the world leaders in catering computer education world-wide. While narrating the technological development, Gurcharan comes to his personal life. He describes his visit to the ashram of guru Radhaqami in 1980. His parents were living near ashram. There the use of technology shocked Das. He found the ashram area as a clean spiritual heaven combined with technology.

2.1 SUCCESS STORIES OF INDUSTRIALISTS:

India has thousands of industrial success due to modern technology. In his narrative *India Unbound*, Gurcharan Das elaborates the success stories of industries in India from cities like Bangalore, Hyderabad, Chennai, Pune, Gurgaon which have software companies earning foreign currency in following lines he writes, "A tiny two year old company in Bangalore called Armmedia achieved a breakthrough in designing a chip for digital TV in 1999; America's Broadcom bought it for \$ 67 million and made its forty three employees rich beyond their wildest dreams. Ranbaxy, Dr Reddy's Laboratories, Cipla, and Wockhard are building successful global business in generic drugs..... and McKinsey projects that this could grow to a million jobs earning \$50 billion in revenues by 2010. (xvii).

Various industrialists in India has significant role in bringing new technology in the nation. Das tries to motivate readers by describing the role of these business leaders of India.

2.1.1 Contribution of Business Leaders for Technological Advancement in India:

Gurcharan Das depicts the contribution of G. D. Birla as successful businessmen. G. D. Birla was the initiator who had started various industries in India like jute, sugar plants, soaps and chemical productions and paper making company called Orient Paper. India needs such entrepreneurs in bulk. Das comments that the reason of lack of progress in India is India's obtrusive bureaucracy to kill industrial revolution at birth so India has remained in the category of technologically undeveloped. History tells the story of Gujarat why even now Gujarat is at the first rank in industrial development and getting the more foreign currency and technology. Gujarat had developed from Seventeenth century in the business and industrial sector. Kusrubhai Lalbahi is another legendary man from Gujarat who had established textile mills during 1895 to 1905. He tried successfully for dye and synthetic colour factory. He brought the foreign technology for that. Das criticizes the policy of Nehru government of intellectual blueprint of state directed industrialization, based on publically owned industry and insulated from international competition which was basically not favourable for development. Gurcharan Das points out that the manual skills and the Indian artisan could be no substitute for technological progress in India. Before independence British tried deindustrialization in India as it was the rule for their colony.

How technology can change life. The story of Aditya Birla is significant. He has flourished his business. Gurcharan Das narrates that how Aditya Birla used the technology to expand his business all over the world and how his business skills were suppressed by MRTP Act and Inspector Raj. Aditya Birla's global industrial world is described by Gurcharan Das in an essay "Marchants of Marwar" in *India Unbound* in following words:



CULTURAL ANALYSIS OF SUDHA MURTHY'S *DOLLAR BAHU*

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ABSTRACT:

Sudha Murthy's first novel Dollar Bahu (2003) deals with two different cultures of India and America. A Cultural Study of Sudha Murthy's Dollar Bahu is a study of the culture and beliefs of the two nations, India and America. According to Richard Johnson, the text is no longer studied for its own sake, nor even for the social effects it may be thought to produce, but rather for the subjective or cultural forms which it realizes. Cultural studies can be found in many forms like literature, media, sociology, politics, geography, and also on the study of different racial and ethnic groups as well as on women's studies, lesbian and gay studies. The analysis of the novel discusses the custom and beliefs of two cultures India and America with the help of the theory of Cultural Studies.

Key Words: Culture, Literature, Cultural Studies, Etc.

Introduction:

Cultural Studies indicates the co-relation between literature and culture. Basically, literature is one of the forms of Cultural Studies. "Culture means the complex and learned behaviour of Society"¹. (Margaret Mead) "It is also defined as a complex whole of knowledge, belief and morals, law, customs and other characteristics and habits acquired by man as a member of society"². (Sir E. B. Tylor) Richard Hoggart used the term "Cultural Studies"³ in 1964 when he founded "Centre of Contemporary Cultural Studies". Cultural Studies investigates how "Culture" creates and transforms individual experiences, everyday life, social relations and capacities. It deals with understanding culture in all its complex forms and examines the social and political background in which culture formulates itself. It mainly centres on a particular experience relating matter of beliefs, nationality, customs, social class and gender. Reading *Sudha Murthy's Dollar Bahu* is to experience the cultural background of various characters and the difference in their thinking due to it.

Sudha Murthy is an Indian writer. She was born on 19th August 1950 in Karnataka, India. She is best known for her social work. She is a bilingual author writing in both Kannada and

- ¹ https://www.academia.edu/6895403/Margaret_Mead_and_Cultural_Studies_Introduction_to_The_Study_of_Culture_at_a_Distance_by_Margaret_Mead
- ² <https://www.iedunote.com/culture>
- ³ https://www.academia.edu/185888/Richard_Hoggart_and_Cultural_Studies

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ONLINE TEACHING AND LEARNING PROCESS: EXPERIENCES, FELT PROBLEMS AND SUGGESTIONS: A SURVEY

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ABSTRACT

This research is conducted by using a qualitative content analysis approach. The content is received by conducting interviews on phone calls and WhatsApp Chat. The purpose of the research is to study online teaching experiences, problems faced and remedies suggested by the teachers engaged in the online system of teaching. The findings of the case study research are helpful to know about the paradigm shift in the teaching-learning process. In the COVID-19 pandemic situation, online teaching-learning is playing a very important role. The technology is ready to support and the proper training can help teachers and students to adjust with the situation.

1.Objectives:

- 1.1.1 To study online teaching experiences and felt problems by teachers.
- 1.1.2 To know remedial aspects suggested by the teachers engaged in the online system of teaching.
- 1.1.3 To study online learning experiences, felt problems and suggestions for quality teaching-learning by the students.

2.Research Design:

2.1 Method: Survey and Interview (Online Technique).

2.2 Population: Teachers and students engaged in online teaching and learning process from the selected colleges.

2.3 Area of Survey:

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A Vivid Description of India in the Narratives of Indian Writers

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Abstract: A narrative is usually thought of author in terms of 'story' and 'discourse'. These two are the core elements in narratives. The story materials that usually comprise events, characters, actions, speech, space, place and time, etc. are given meaning and mobility in course of a narration. The present research paper will focus on the narratives written by Indian authors. The discussion reveals the Indian culture, events, characters, actions, literature, life-style and locations in Indian society. The contribution of all Indian authors in their narratives helps to form an outlook about India.

Key Words: Narrative, India, society, history, culture

Introduction: India always strived for retaining its prestige. The freedom struggle of India is an ideal example of nationalism. The history of India has attracted to many scholars. Indian authors reflect their vivid views regarding India in their narratives. M.H. Abrams defines narrative in his *A Glossary of Literary Terms* (2000):

A narrative is a story, whether told in prose or verse, involving events, characters, and what the characters say and do. Some literary forms such as novel and short story in prose, and the epic and romance in verse, are explicit narratives that are told by a narrator. In drama, the narrative is not told, but evolves by means of direct presentation on stage of actions and speeches of the characters. It should be noted that there is an implicit narrative element in many lyric poems. (173)

A narrative, more or less, is shaped by the cultural, social and psychological experiences of its author who dexterously transmits them into a creative narrative structure. Naturally, Indian writers record the significant culture of India with vividness and sensitivity in their narratives with their experiences. These narrative writers writing about India have different views and the style with which they attempt to portray the image of India. Their perspectives related to religion, politics, society, economy, family and gender are according to their outlook towards Indian society. So their description of India is different but it forms a composite image of India.

Indian English literature is a curious phenomenon with a fairly long history. The growth of Indian English literature has a history going back to nearly a hundred and fifty years. In the world literature, Indo-Anglican literature has served as a mirror in presenting day-to-day events of the society. Meenakshi Mukherjee in her book *The Twice Born Fiction* comments, "Indo-Anglican fiction, which has served

for so long as a file of documents of sociology or anthropology or educational theory, must now be regarded as literature, evaluated as such." (167)

Noticeable examples of Indian English literature during British India are infrequent and periodic works such as *A Passage to India* (1924) by E.M. Forster, *The Wonder that was India* (1954) by A.L. Basham, *Autobiography of an Unknown Indian* (1951) by Nirad C. Chaudhari recounts his mental and intellectual maturation in the metamorphosing Indian scenario, where the British rule was about to come to an end. (Jan Jack, Web)

R. K. Narayan is another prolific writer in Indian English writing. He has the charming capability to fascinate his readers with the portrayal of contemporary Indian society. R. K. Narayan's first novel *Siva and Friends* (1935) is based in the fictional town of Malgudi. It captures the Indian culture in its totality and possesses a distinctive identity of its own. *Bachelor of Arts* (1937), *The Financial Expert* (1952), *The Guide* (1958) and *Waiting for the Mahatma* (1955) are his other popular novels depicting contemporary India. In an article "The Fiction Writer in India", contributed a few years ago to the special *Atlantic Monthly* supplement in India, R. K. Narayan himself remarks about the subject-matter of fiction during the period of National agitation:

After independence, however, the writer in India hopes to express through his novels and stories the way of life of the group of people with whose psychology and background he is most familiar and he hopes that this picture will not only appeal to his circle but also to a larger audience outside. (72)

The Indian freedom struggle had ensued in a revolutionary brand of writing that vocalised native sentiments against the British Empire. Several political leaders like Bal Gangadhar Tilak, Lala Lajpatrai, Kasturi Ranga Iyengar and Mahatma Gandhi etc. from different parts of the country emerged as literary figures. M. K. Gandhi edited and wrote for papers like *Young India* (1919-32) and *Harizon* (1933-48). He also has penned his autobiography, *My Experiments with Truth* (1925-28). This autobiography is known for its literary style. Jawaharlal Nehru is particularly remembered for his *Glimpses of World History* (1934), *Discovery of India* (1946) and *An Autobiography* (1936). Rabindranath Tagore writes about problem of national belonging in *Gora* (*Fair-Skinned*, 1910). He presents British India in his *Chore Baire* (*The Home and the World*, 1916).

Mulk Raj Anand and Raja Rao are among the earliest of Indian novel writers in English. They began to



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Medical Humanities: Pandemic Narratives of Covid-19 Period

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Research Paper - English

ABSTRACT

Medical Humanities enables us to ask questions about crucial issues of social importance like life and its value. The Covid-19 pandemic caused killing millions, but societies did not collapse. Life is still going on, despite the cruelty of the pandemic. Literature during this period thus has the stories of great loss and optimism. Every individual has some experience and story of the pandemic. The present paper leads to the discussion of Medical Humanities, an evolving field that examines writing literature as well as other forms of artistic expressions like dance, art, and cinema, especially in the period of the Covid-19 pandemic. The aim of the research study is to bring attention to the necessity of looking seriously at the ethical part of the medical profession. The study also suggests that Medical Humanities can be introduced as the part of university curriculum of all the faculties. It will help to imbibe the humanistic attitude in the minds of pupils.

Key Words: Medical Humanities, Covid-19, Pandemic Narratives, Narrative Medicine, humanistic expression, etc.

Introduction:

Medical Humanities began in the middle of the 20th century with the term bio-ethics due to the emergence of the money-oriented corporate medical industry, increasing professionalization and dehumanization of patients. It focuses on the importance of human values and ethics in medical practice. The objective and significance of Medical Humanities



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USE OF SYMBOLS IN ADVANCED ONLINE-COMMUNICATION

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ABSTRACT

Non-verbal communication means communication with the help of body language. Everyone who wants to improve his communication skills should know the effective use of body language. When a person interacts or communicates he uses some gestures, postures, eye contact, etc. consciously or unconsciously this is called body language. The personality of a person is not only judged by his spoken words but with the help of the body language he uses during the communication. The people know less about the conscious use of body language. This paper definitely helps to understand various types of body language and how one should be aware of his own body language. The research paper mainly will focus on Computer-Mediated Communication (CMC) which has influenced day-to-day human life. It has many advantages in this technological era for people using Android mobiles and computers. So, this paper aims at knowing Computer Mediated Communication use of symbols and cues in social media for communicating.

Key Words: emoji, Computer Mediated Communication, Emojipedia, Body Language

INTRODUCTION

Thorough knowledge and understanding of the concept of body language and its various types are necessary for every field of communication such as day-to-day dealings, business,

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ALLUSION OF TECHNOLOGY EDUCATION IN CHETAN BHAGAT'S WHAT YOUNG INDIAN WANTS AND A.P.J. KALAM'S WE CAN DO IT: A COMPARATIVE STUDY

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Author

ABSTRACT Technology education for students at the secondary school level is one of the steps India is taking to advance its technological landscape. In *We Can Do It*, A.P.J. Kalam discusses the model used by M.R. Raja, Azim Premji, Shiv Nadar, and others for the anticipated change in Indian schools. This model is offered for value education, and when all these actions are taken together, the percentage of school dropouts will be significantly lower than it is now. In *What Young India Wants*, Chetan Bhagat explains a thorough analysis of how the top technological institutes in India operate. He criticizes the failure of Indian technical institutes to develop the innovative capacities and skills of the students. He focuses on how India can make progress by empowering youths with abilities to create and innovate. The paper will find out the allusion of technology in the writings.

KEYWORDS : technology, education, creativity, innovation

INTRODUCTION

In *We Can Do It*, A.P.J. Kalam discusses the need of technological education in the secondary schools in India. He proposes the idea to establish "Village Panchayat Knowledge Centers" and to promote education through virtual universities. He stresses that Indian students must focus on improving their skills in light of globalization to get job in any part of the world. In *What Young India Wants*, Chetan Bhagat also enlightens a systematic investigation of how the top technological institutes in India work. He criticizes that technological education is lacking in creativity, innovation, and imagination. Innovation, in his opinion, entails questioning the status quo, which is simply not beneficial for Indian children who respect the tradition of their elders. A.P.J. Kalam, writes that foreign rulers prevented India from developing technologically. He believes that the barrier to technological advancement was caused by the brain and resource drain from India prior to independence. India was unable to participate in the industrial revolution and prosper, while Western nations took advantage of the opportunity. These countries developed into exports at manufacturing bulk consumer goods. The two World Wars also encouraged these nations to produce cutting-edge military technology. To establish a high level of competence during the cold war, the technological industries in developed nations continuously developed high technology systems.

In his non-fiction narrative *What Young India Wants*, Chetan Bhagat makes the observation that people who work as country-liquor barons, saree manufacturers, and sweet home shop owners open technical colleges for engineering, and people entrust them with raising their children and providing for their future. Chetan Bhagat thinks that excessive mechanization and rationalization are a burden to human survival. The development of cyber technology has created new opportunities for living, but its effects are too onerous to put human sensibility at risk. Bhagat offers the advice to face life's challenges head-on at each stage in order to avoid the gloom that is affecting Indian youths' quality of life. He points out, "we are people, not programmed devices". (105) According to Chetan Bhagat life is not to be taken seriously, as human beings are really temporary, here they are like pre-paid cards only with a limited validity.

The brain drain is cited by A.P.J. Kalam as a barrier to India's technological advancement. He claims that young people with great talent leave India for developed countries. These young people invent technology, which is unquestionably a product of advanced economies. Kalam writes in this regard in *We Can Do It* as- "This means the developed countries keep an edge on technology, industrial production with higher market share and economic growth continually, and the developing countries lose their skilled manpower, industrial production and resources, and continue to be economically behind them. This is a major challenge to a developing country that aspires to become a developed country. Indian youth needs to understand to trap". (13)

A.P.J. Kalam also acknowledges the various technology in agricultural development. A.P.J. Kalam, puts his opinions to the

contribution of technology to agricultural development. He claims that although the agricultural sector in India employs about 50% of the labour force, it only contributes about 17% of the country's total GDP. In contrast to the industry sector's 11% growth, the agricultural sector's growth rate in 2017 was 2.7%. In many regions of the country, agricultural growth and productivity have seen notable successes.

He believes adopting techniques like multi-cropping with controlled drip irrigation, scientific farming, building dependable agricultural and food processing infrastructure, increasing ground water availability, and having access to electricity 24 hours a day will give farmers the best insurance and increase their earning potential. Only by establishing ethical agricultural cooperatives, which use their collective knowledge as a business house to plan, manage, and market agricultural and agro-processed products for higher levels of income to the farmer with a guaranteed year-round occupation, is such a situation even possible.

A.P.J. Kalam offers suggestions for how India can advance technologically. He explains that the Department of Science and Technology's TIFAC (Technology Information, Forecasting and Assessment Centre) is conducting a study on Technology Vision 2020 to determine the precise areas that need to be developed as well as a roadmap for getting there. It identifies five technologically-driven development areas: (i) agriculture and food processing for food security; (ii) education and healthcare for social security; (iii) information and communication technology and mass employment; (iv) infrastructure including electric power, river networking, and PURA for economic development; and (v) critical technologies and strategic industries for self-reliance.

In this regard, Chetan Bhagat has come to the realization that the speed of cyber-technology development is insufficient to keep up with agriculture. The primary goal of the resources promoted in India should be to advance the development and sensibility of the average person. He questions why an Indian farmer should be denied access to such a lucrative foreign market if an Indian software company can provide services abroad. Technology-based factories that turn milk into cheese, butter, ghee, and other milk products can help Indian farmers expand their business overseas.

Additionally, Chetan Bhagat makes a point about the invasion of foreign businesses that aim to plunder the Indian economy and industry. He criticizes Facebook and other social networking sites. Chetan Bhagat makes an ironical comment in *What Young India Wants* that "None of our blue chips have the capability to invent technology like the cell phone but being opportunistic; they jump at chance of making money off spectrum allocation". (17)

Like a sensible and committed citizen, Chetan Bhagat dictates that India must develop a system to promote entrepreneurial spirit. The nation's foundation is undoubtedly being eroded by the growing tendencies to manipulate resources produced by profit. The content and observation of Chetan Bhagat show the irony and the pain of a





A Critical Study of Anuja Chauhan's *The Zoya Factor* as the Indian Cricket Fiction

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Abstract:

The Zoya Factor (2008), a best-selling novel by Anuja Chauhan, tells the love story of Zoya Singh Solanki, who is upset being single and Nikhil Khoda, the captain of the Indian Cricket team. The book has drawn attention for its prominent themes, including autobiographical novel, chick lit, young adult fiction and romantic narrative. The author presents 21st century middle-class India with subtlety. She narrates humorously the urban middle-class English-educated but bilingual global desi type. The characters in the novel will be showing indianness. The goal of the current study in this paper is to focus on The Zoya Factor as the Indian cricket fiction. The study comprises dependent, independent, demographic, and extraneous variables like the qualities and characteristics of the writer and the selected work. The study used the textual analysis method and the biographical method. The hypothesis of the study is Anuja Chauhan's novel The Zoya Factor (2008) is an Indian cricket fiction. To discover the discussion of cricket, the study included a review of works by Indian authors such as Salman Rushdie, Amitav Ghosh, Vikram Seth, Anita Desai, or Upamanyu Chatterjee, Anuja Chauhan, Sujit Mukherjee, Pramesh Ratnakar, and Sushil Gupta. The focus is on celebrating the selected novel by Anuja Chauhan and its significant theme of cricket fiction.

Key Words: Indian, romantic, cricket, fiction, realistic, comedy.

Introduction:

Anuja Chauhan (1970-) is a creative Indian writer. She is well known for her advertisements, screenplays and bestselling narratives. She has created numerous popular advertising campaigns, including 'Nothing Official About It,' 'Yeh Dil Maange More,' and 'Oye Bubbly,' for cola giant Pepsi. The Zoya Factor (2008), Battle for Bittora (2010), Those Pricey Thakur Girls (2013), The House That B.J. Built (2015), Baar (2017), and Club You to Death (2018) are among her most well-known works. The Zoya Factor a romantic novel. Zoya met Nikhil the team captain and the Indian Cricket Team through her job as an executive in an advertising agency. She is supposed to be lucky as she was born on the exact date and time as India won its first world cup in the year 1983. So gradually Indian Cricket team except Nikhil accepts her as a lucky charm for the team for the world cup of 2011. The title suggests the significance of the twenty-seven-year-old heroine Zoya's luck factor and its winning effect for the Indian cricket team. All characters' love for cricket reflects their

ultimate love for nation. Thus, a hugely entertaining and popular novel, makes fun of the Indian obsession with cricket which shapes the novel as Romantic Comedy.

Materials and Methods: The data has been collected using qualitative research methodology, especially the textual analysis method and biographical methods. Other methodologies used are surveying and collecting related book reviews, newspaper reviews, interviews with the author, and researching articles related to the theme. In addition to these, major methodologies employed are exploratory, interpretative, evaluative, and analytical. Critical and comparative analysis is the central agenda for the research. The study of the selected work is done from a thematic point of view. The details are as follows;

2.2 Data and Sources of Data: Anuja Chauhan's The Zoya Factor (2008) and M. H. Abrams' A Glossary of Literary Terms (1999) are the primary sources used for the study, and secondary data has been collected from various books, and websites like hindustantimes.com., thehindu.com. etc. The



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ANALYZING THE AFFECTIVE FALLACY IN LITERARY CRITICISM
OF ANUJA CHAUHAN'S FICTION *THE ZOYA FACTOR*

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Abstract: Anuja Chauhan is a creative writer. She is well known for her advertisements, screenplays and bestselling narratives. Anuja Chauhan's bestselling fiction *The Zoya Factor* (2008), recounts the life of the central character Zoya Singh Solanki who is a Rajput woman. The novel has various themes like autobiographical novel, chick lit novel, novel about cricket and romance, etc. The present research paper tries to find out intentions of the author to write the selected novel and will focus on the impact of affective fallacy on its literary criticism. It will discover both the subjective and objective criticism on *The Zoya Factor*. Finally, the paper will also discuss the aesthetic charm of the novel which attracts the readers and reviewers who believes in the term *Art for Art's Sake*.

Key Words: Affective fallacy, autobiographical novel, chick lit, romantic fiction, subjective criticism, objective criticism, Art for Art's Sake, etc.

Introduction:

Anuja Chauhan (1970-) was a vice president and executive creative director at JWT, an advertising agency in India. She resigned this job in 2010 to pursue a full-time writing career. She has created numerous popular advertising campaigns, including 'Nothing Official About It,' 'Yeh Dil Maange More,' and 'Oye Bubbly,' for cola giant Pepsi. *The Zoya Factor* (2008), *Battle for Bittora* (2010), *Those Pricey Thakur Girls* (2013), *The House That BJ Built* (2015), *Baaz* (2017), and *Club You to Death* (2018) are among her most well-known works. *The Zoya Factor* is the story of Zoya who met the Indian Cricket Team through her job as an executive in an advertising agency and gradually ended up becoming a lucky charm for the team for the world cup of 2011. The reason why she is supposed to be lucky is that Zoya was born on the exact date and time as India won its first world cup in the year 1983.

M. H. Abrams defines the term intentional fallacy in *A Glossary of Literary Term* as:

They asserted that an author's intended aims and meanings in writing a literary work whether these are asserted by the author or merely inferred from our knowledge of the author's life and options ...within the finished, free stand and public work of literature itself. (P.175)

The very opposite term of the intentional fallacy is the affective fallacy. The term Affective Fallacy was first used by William K. Wimsatt and Monroe C. Beardsley to denote what they regarded as the wrong practice of interpreting texts according to the psychological responses of readers.



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Scanned with OKEN Scanner

Women's Socio-Economic Condition Reflected in 9 Jakhoo Hill

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Abstract:

Gurcharan Das (1943), a contemporary Punjabi writer, has written Three English Plays (2001) on different essential themes and distinct styles. It is the splendour of the thematic aspects of these plays that indeed fascinate the attention of the readers, amateur or expert in English literature. Out of his three plays 9 Jakhoo Hill is written in the 1990s, first performed in 1996, and represents India in 1962 during the Indo- China war. It deals with the passing era and the rise of a new mercantile class and with it the advent of the new world with its new culture. Gurcharan Das in his famous play, 9 Jakhoo Hill, offers the contemporary socio-economic problems of Indian women. The play reveals women's socio-economic problems, especially those with no male in their families. Such families have comparatively more issues in their lives. The paper will focus on the family of Amrita.

Key Words: - Socio-economic, financial rights, feminine issues, economic changes on human relationships, etc.

Introduction:

9 Jakhoo Hill is the last play written by contemporary and prolific writer Gurcharan Das. In this play, Das depicts a critique of social, economic problems. 9 Jakhoo Hill is the name of summer residence belongs to Amrita, her brother Karan referred to as Mamu in the play and her daughter Ansuya. Amrita is 'a lady from a fine family' (143), whose husband died during the riots of India Pakistan Partition and they lost all they had in Lahore.

Ansuya, Amrita, and Ansuya's father moved to Delhi, where they established a couple of mills and a large sprawling house in Civil Lines. After her father died, they sold their mills and house and relocated to 9 Jakhoo Hill in Simla, which was once their summer residence and is now the only asset they have left. They must sell 9 Jakhoo Hill because they can no longer afford to maintain it. As a result, the fatherless family becomes the ship in thunder, fighting against all odds. These three-Amrita, Mamu, and Ansuya-represent a glorious past that has passed. These three have spent their entire lives in luxury and passivity, and they are now completely bankrupt as a result of the pompous display they put on for their false identities.

Amrita: See those drapes, Ansu? Your father brought them from
England, and they were the talk of the town that season.
Oh, the parties we used to have, Ansu! The servants were
forever polishing the silver. Why the whole of Nehru's first
Cabinet must have dined here sometime or the other. (2)

(Act 1 p. 152, 9 Jakhoo Hill)



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Digital hearts: A youthful journey through love and identity in love @ Facebook by Nikita Singh

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Abstract

Nikita Singh (born October 6, 1991) is famous as India's leading romance writer. All her novels deal with contemporary themes and rising trends. At the same time, it will also bring into light how these rising trends have become an inseparable part of our lives. Readers witness the modern ways being adopted very easily in all of her novels. At the age of eighteen, she wrote juvenile fiction and her very first book, Love @ Facebook (2011), which became a best-seller. The fiction is easily relatable, akin to neighborhood stories. The goal of this research paper is to investigate virtual romance in the digital age. The love triangle that forms between Ankit, Ronit, and Vatsala will be highlighted, illustrating how the current generation's romantic preferences are evolving. The research paper will also explore the ways in which social media platforms such as Facebook and Twitter impact the younger generation.

Keywords: Romance, virtual, digital, young adult, Facebook

Introduction

Nikita Singh has written famous bestseller novels like *The Reason is you* (2019), *Every Time It Rains* (2017), *Like a Love Song* (2016), *The Promise and After All This Time* (2010), *Letters to My Ex* (2018). She has also edited an anthology of stories entitled *25 Strokes of Kindness*. In 2011, she joined Grapevine India as an editor and signed a contract with Penguin Books India. While pursuing her studies in pharmacy at the age of nineteen, she wrote her first book, *Love @ Facebook*. In the young adult novel *Love @ Facebook* (2011), a nineteen-year-old girl befriends a VJ on Facebook and eventually falls in love with him. Nikita Singh informs us in a very unfavorable way that we have become contingent on the huge social networking site "Facebook" and that it has become an integral part of our lives in her novel *Love @ Facebook*. It all began with a "Friend request" button. One Saturday night, a girl, bored, turns the channels and finds herself watching a random MTV TV show hosted by a handsome young man. She finds him on Facebook out of curiosity and ultimately sends him a friend request. The author depicts a young teenager who is jumbled about her feelings about whom she loves. The research study is to find out the disturbed psychology of the youths due to social media presented in a form of virtual romance.

Materials and Methods

The researcher will use critical and analytical methods for finding the facts. The study will be based on primary and secondary sources. The primary sources will be the original texts and secondary sources will be the books, research articles and material available in the libraries and on the internet. The novel selected for the research is *Love @ Facebook* (2011) by Nikita Singh^[1].

Results

Love @ Facebook is excellent illustrations of commercially erotic literature, and the writer herself is a model of a prosperous literary entrepreneur who devotes her time to writing and reaps financial rewards. Singh successfully offers a brief and pleasant delight in this novel because the novel is primarily intended for teeny's youth and incorporate emotional elements with ease. So, for the readers it is a simple story that can be read and forget without even trying to remember anything.

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RESEARCH ARTICLE

NAVIGATING THE NEXUS: A CRITICAL INQUIRY INTO THE INTERSECTION OF EDUCATION AND POLITICAL POWER IN RAVINDER SINGH'S YOUR DREAMS ARE MINE NOW

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Contemporaneity, Vulnerability, Gender, Caste, Political, Social Issues, etc

Abstract

The novels written by Ravinder Singh (February 4, 1982) cover a wide range of important themes, including friendship, marriage, sexuality, family conflict, personal tragedy, emotion, social issues, caring, and romantic relationships. The goal of this research paper is to identify the themes such as love, lust, corruption in education, women's exploitation, and social injustice that can be found in Ravinder Singh's novel *Your Dreams Are Mine Now*. The paper will examine the harshness of political interference in the educational system. It will mainly focus on the somowful story of two lovers fighting for women's security which represents the vulnerability of contemporary social injustice brought on by gender and caste disparities.

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Introduction:-

Ravinder Singh essentially, was employed as an IT professional prior to beginning to write. His first book is an autobiographical novel called *I Too Had a Love Story* (2008). The Kannada version of this book, *Nannadu Orda Prema Katha*, was also published. Ravinder is an entrepreneur and digital creator as well. Ravinder has developed into a more prosperous and well-rounded person since the release of *I Too Had a Love Story*. For his 2013 book, *Like It Happened Yesterday*, Ravinder Singh received a nomination for the popular award category of the Raymond Crossword Book Award. He wrote in particular about the tragedies in his life. In addition, he writes young adult novels in Indian literature. His most well-known pieces are *I Too Had a Love Story* (2008), *Can Love Happen Twice?* (2011), *Tell Me a Story* (2015), *Your Dreams Are Mine Now* (2014), and *Will You Still Love Me?* (2018). *Your Dreams Are Mine Now* has themes like friendship, marriage, sexuality, family conflict, emotion, social issues, caring, and romantic relationships.

Discussion:-

Ravinder Singh's *Your Dreams Are Mine* has covered a wide range of themes, including marriage, the education system, caste, corruption, politics, love lives, and more. In his writings, he accords both male and female characters' equal significance. He has demonstrated his ability to express a variety of social issues in a way that resonates with the younger generation of Indian society today. His female characters are the ones who prioritize both their personal and professional lives. Ravinder Singh's female characters are portrayed as strong, bold, and beautiful, and they possess some extraordinary qualities. But the end of the story will make readers cry because Rupali was being raped by cruel people. Arjan lost his conscience and cried a lot. He used to read her old texts. He campaigned for her "justice" and gained the support of everyone across the country.

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ECHOES OF WAR AND WINGS OF LOVE: A CRITICAL STUDY OF ANUJA CHAUHAN'S ROMANTIC NOVEL *BAAZ*

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Abstract

Anuja Chauhan (17 September 1970) is an Indian author, advertiser, and screenwriter. Because of her engaging storytelling style, she has created marvelous scope in her writings for interesting characters to develop attractive plots. So, Anuja Chauhan's novels are bestsellers and loved by authors. The selected novel for a research study is, Anuja Chauhan's *Baaz* (2017). At heart, this novel narrates a love relation between a peacenik and a pilot, with war as the backdrop. It is a story of Shaanu aka Baaz aka Ishaan and Tehmina and supportive characters Raks, a MIG-21 Fighter, Maddy, a transport pilot who flies a Caribou, and fellow Gnatties Jana, Gana and Mana. The Indian romantic novels will be briefly discussed in this paper and the primary focus will then be the analysis of the themes and characters in *Baaz*. Additionally, it will look into how *Baaz* differs from Anuja Chauhan's previous novels in that it has a male protagonist and creates a male space. It will also find out Anuja Chauhan's autobiographical reflections in the novel.

Keywords: 21st century women characters, male space, autobiographical novel, romantic fiction.

Introduction

Anuja Chauhan (born 1970) held the position of vice-president and executive director of JWT, an advertising agency in India, until her resignation in 2010 when she decided to dedicate herself to a full-time writing career. Renowned for her contributions to advertising, she crafted several successful campaigns such as 'Nothing Official About It,' 'Yeh Dil Maange More,' and 'Oye Bubbly,' for cola giant Pepsi. Her notable works include *The Zoya Factor* (2008), *Battle for Biltora* (2010), *Those Pricey*

Thokur Girls (2013), *The House That BJ Built* (2015), *Baaz* (2017), and *Club You to Death* (2018).

Research Methodology

The researcher will use critical and analytical methods for finding the facts. The study will be based on primary and secondary sources. The primary sources will be the original texts and secondary sources will be the books, research articles, and material available in the libraries and on the internet.

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Dr. Vibhati Vasant Rao Kulkarni



CHRONICLES OF THE PRESENT: A CRITICAL EXPLORATION OF CONTEMPORANEITY IN *THOSE PRICEY THAKUR GIRLS* BY ANUJA CHAUHAN

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ABSTRACT:

Anuja Chauhan (September 17, 1970) is an Indian author, advertising professional and screenwriter. Chauhan's novels have major themes like blind faith in superstition, corruption in politics, state sponsored propaganda, muscular patriotism, murder mystery, suspense, love, marriage, romance comedy, cricket romance, historical fiction, adult fiction, quirts of the residents, censorship, relationship conflict, childhood memories, and Indian elections, etc. The purpose of the current research paper is to identify the hues of contemporaneity present in the novel *Those Pricey Thakur Girls* (2013) by Anuja Chauhan. This paper will also discover the themes and characteristics of the selected contemporary novel for the study.

Keywords: Romantic comedy, political corruption, press censorship, contemporaneity, domestic fiction, chick lit, rom-com, etc.

1. INTRODUCTION:

Anuja Chauhan a rom-com writer, born in Meerut, Uttar Pradesh, India, on 17th September 1970. She is youngest among four sisters: Padmini, Rohini, Nandini, and Anuja. Her early years were primarily spent in various cantonments town in North India due to her father's service in the Indian Army. Anuja Chauhan is married to Niret Ajva who is television presenter and producer. Together, they have three children: two daughters' name Niharika and Nayanara and a son named Daivik. In her writing career, she is renowned for works like *The Zoya Factor* (2008), *Battle for Bittova* (2010), *Those Pricey Thakur Girls* (2013), *The House That BJ Built* (2015), *Baze* (2017), *Club You to Death* (2021), and *The Fast and The Dead* (2023). She has spent more than seventeen years at the JWT (James Walter Thompson) advertising agency in India, where she eventually reached the position of vice-president and executive creative director. In 2010, she made the decision to step away from her advertising career to fully pursue her passion for writing.

The main objective of this article is to explore the relevance of Anuja Chauhan's novel *Those Pricey Thakur Girls* (2013) in today's world. It seeks to examine how this novel relate to contemporary society in the twenty-first century. The concept of "Contemporaneity" is integral to this analysis, encompassing various factors, including the state of individuals, their social connections, and the artistic ideas presented in Anuja Chauhan's novel *Those Pricey Thakur Girls* which align with the dynamics of the twenty-first century. In the Oxford dictionary, the term "Contemporaneity" is defined as "a contemporaneous state or condition". This state can manifest in any place or time and can be experienced by individuals, groups, or entire societies. However, the term Contemporary in the broader context becomes apparent to describe a global situation. Though *Those Pricey Thakur Girls* is the story of 80's but shows the contemporaneity in social background, issues in relationships, political corruption, censorship, career ups and downs, and marriage problems, etc. which resemble to the today's world.

To read *Those Pricey Thakur Girls* is an experience of watching a romantic movie, where one can clearly understand all characters and their unique qualities. In India, romance can be synonymous with film or movie. Much of our imagination and love expression comes from movies. In most of the Hindi cinemas, a romantic plot is needed. Just like that Anuja Chauhan has portrayed two love birds a 23 years old newsreader on Desh-Darpan TV channel, in Delhi, Debjani Thakur and Dylan Singh Shekhawat, a 28 years old investigative editor of India Post, in Mumbai. Retired Justice Laxmi Narayan Thakur who is the father of Debjani (Dabba) and Retired Brigadier Saahas Singh Shekhawat, father of Dylan, are very good friends for so long. That is the reason Debjani and Dylan gets connected with each other. Dylan who lives in Mumbai, comes to Delhi for vacations. And meet Debjani Thakur at her house which is on Hailey Road, in Delhi. Without realizing he started liking her and flirts.

After Debjani's first news reading broadcast on Desh-Darpan, article from India Post badly criticizes news reader Debjani calling her, "DD's dumb doll doesn't please at all" (*Those Pricey Thakur Girls*: page no. 22) So she decides to improve herself in news reading. As Dylan is well experienced journalist, helps Debjani and as a result of that her second news reading on DD goes perfect. During this process everyone from the both families thinks that they fell in love with each other and it exactly happens. However, Dylan refuses, then accepts decides to make it official. So, Laxmi Narayan Thakur invites Shekhawat family for tea. Everyone was happy including Debjani and Dylan but things go wrong, the day of family meet Debjani and Dylan didn't know about the article "Roving Eye" which was written by Dylan Singh Shekhawat and didn't even he confessed to her. So the gap entry on him and their ways falls apart for a specific time period.

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□□□

प्रकृति से साक्षात्कार इब्सन के देस में : डॉ. विनोद बब्बर

पूनम सत्यनारायण शर्मा
शोधछात्रा
पीपल्स महाविद्यालय, नाटेंड

डॉ. सौ. अरुणा रजेंद्र शुक्ल
शोषालेख प्रस्तुति
हिन्दी विभागाम्बवा, शोम निर्देशिका
ना.ए.सो.सायन्स कॉलेज, नाटेंड

साहित्य के क्षेत्र में विनोद बब्बरजी का नाम उल्लेखनीय है। विनोद बब्बर कहानीकार, व्यंग्यकार, कवि, निबंधकार तथा पत्रकार के रूप में अपनी विशिष्ट पहचान रखते हैं। विनोद बब्बर देशभर में प्रसिद्ध राट्ट-किंकर नामक साप्ताहिक पत्रिका के संपादक भी हैं।

इब्सन के देस में एक महत्वपूर्ण यात्रा-संस्मरण है। इस संस्मरणाल्पक यात्रा-वर्णन को पढ़ने के पश्चात देस विदेशों में प्रमण करने के शौकीन, अबक पर्यटक के रूप में रचनाकार की तस्वीर मन में उभरती है। पच्चीस अध्यायों में जहां राट्ट-विन है वहीं अंतिम सोलह रंगीन पृष्ठों पर संपूर्ण नाट्य के दर्शन से ग्रंथ की उपयोगिता तथा आकर्षण अधिक बढ़ जाता है।

विनोद बब्बर एक चित्रकार भी हैं। अतः उनकी विचालक भाशा पैली का वैशिष्ट्य इस कृति में भी परिलक्षित होता है। यह यात्रावृत्त रेखाचित्र के काफी निकट है कठिनाइयों पर विचार उनका प्रथम एपीसोड है जिसमें लेखक ने पासपोर्ट एवं वीजा समस्याओं को शब्दशः अंकित किया है। दिल्ली से मास्को और फिर मास्को से ओस्लो के लिए हवाई



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सुतीय एव सवरो महत्वपूर्ण तरीका जो मूल्यों के निर्माण में शिक्षक के योगदान को रेखांकित करता है, वह है शिक्षक का व्यक्तिगत आचरण, व्यवहार एव आदर्श। शिक्षक एवं प्रतिमान होता है, जिसका छात्रों के जीवन पर सर्वाधिक प्रभाव पड़ता है। ऐसा माना जाता है कि इस अभ्यापक को चरित्र का सख्खात स्वरूप एवं सदगुणी व्यक्ति मानना है, वह उसे एक आदर्श व्यक्ति का चलता-फिरता उदाहरण (a working model of the good person) मानता है। शिक्षक अपनी इसी भूमिका की छाप छात्र पर डालता है, जिससे मूल्यों का संरक्षण एवं विकास होता है। एशियाई देशों में नैतिक शिक्षा पर संयुक्त अध्ययन दल (JSMEA) की रिपोर्ट में स्पष्ट कहा गया है कि राष्ट्र का अस्तित्व मूल्यों का संरक्षण करने वाले अच्छे व्यक्ति अर्थात् शिक्षक पर निर्भर करता है। रिपोर्ट के अनुसार "आध्यात्मिक या सच्ची शिक्षा छात्र में ज्योति प्रज्वलन के समान है, जो तब तक सम्भव नहीं है जब तक ज्योति जलने वाला कुशल न हो। शिक्षक को अपने व्यक्तिगत उदाहरण द्वारा योगी की तरह व्यवहार करना चाहिए।

महात्मा गाँधी के अनुसार— "इसके लिए (मूल्यों के सृजन हेतु) सर्वप्रथम शिक्षकों को इन सत्तों को अपने जीवन में उतारना होगा। शिक्षकों के आचरण का अनुकरण करके ही बच्चे सत्य एवं न्याय जैसे जीवन मूल्यों को जो कि सभी धर्मों का आधार है, सीख सकेंगे। ये जीवन मूल्य शब्दों या पुस्तकों के माध्यम से नहीं सिखये जा सकते।"

इस प्रकार शिक्षक का व्यक्तिगत व्यवहार, आचरण, शिक्षण विधि सभी छात्रों में मूल्यों के विकास में सहयोग कर सकते हैं। इसलिए शिक्षकों को चाहिए कि वे मूल्य शिक्षा में अपनी महान भूमिका को समझे और पूर्ण निष्ठा और ईमानदारी से अपने दायित्व का निर्वहन करें।

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विश्व के प्रत्येक अंश की अपनी विशेषता होती है। उस विशेषता या विशिष्टता के मलबुते पर वह अंश अपनी स्वतंत्र सत्ता स्थापित करने में सफल होता है। विश्व का प्रत्येक अंश जड़ चेतन की विशाल परिधि में समेट लिया गया है। प्रकृति की ओर से चेतन जगत में केवल दो रूपों की सृष्टि हुई है। नर-एवं मादा पशु-पक्षी, जीव-जंतु, पेंड-पौधे आदि का विकास भी इन्हीं दो रूपों में पाया जाता है। इस संपूर्ण जीव सृष्टि में सर्वाधिक प्रभावशाली अंश किसी का रहा है तो वह मानव सचेतन इकाई प्रकृति में नारी के इस परस्पर सम्बन्धों से ही इस विशाल सृष्टि का विकास हुआ है।

प्रत्येक समाज में नारी की स्थिति उस समाज में प्रचलित मान्यताओं आदर्शों, मूल्यों के अनुसार निर्दिष्ट होती है समाज की अधिकांश पुरी पुरुष द्वारा निर्मित होने के कारण नारी के स्वतंत्र अस्तित्व को स्वीकार नहीं गया उन्हीं के अनुसार मात्र स्त्री पुरुष रूपी पुरी के चारों ओर परिक्रमा करते रहे। नारी के इस स्थिति के बारे में डॉ. शीला रजवार लिखती हैं, "हिन्दु संस्कृति हमेशा से ही पुरुष को प्रधानता प्रदान करती रही है। पुरुषार्थ चतुष्टय (धर्म, अर्थ, काम, मोक्ष) की यथमूल धारणा इस बात का द्योतक है। विद्वानों ने भी उसके इसी रूप का अध्ययन, मनन, चिंतन कर व्यवहार जगत में उसके लिए नियम निर्धारित किए और पुरुष के जीवन और उद्देश्य में जिस रूप में सामने आई उन्ही रूपों का विवरण किया।"^१

संभवता इसी कारण उसके स्वरूप को पुनः

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२. अज्ञेय एवं मुक्तिबोध की समकालीन कविता

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कविता मूलतः युग सन्दर्भों की देन है। उसमें अतीत के चित्रण और भविष्य के संकेत भी युग सन्दर्भ से जुड़कर ही आते हैं। इसलिए यह कहना उचित होगा कि प्रत्येक रचना समकालीन होती है। ऐसे में किसी युग विशेष की पहचान समकालीन कविता के रूप में सुनिश्चित करना एक जटिल प्रक्रिया होगी। युग सन्दर्भों के साथ काव्य, प्रवृत्तियों में निरन्तर परिवर्तन होता चला आया, इसलिए अपनी व्यापकता में प्रत्येक रचना समकालीन है। जहाँ तक समकालीन कविता के सन्दर्भ में यह शब्द प्रयुक्त किया जाता है, उसके पीछे कुछ अन्य कारण भी हैं। वास्तव में समकालीन का यहाँ अर्थ है - अपने समय का। इसके पर्याय के रूप में समसामयिक, युगीन अद्यतन ऐसे अनेक नाम प्रचलित हैं। इसके बावजूद सम सामयिकता और समकालीनता में अन्तर है। एक समय में रहना और एक कालखण्ड का जीना दोनों में अलग-अलग स्थितियाँ हैं। ऐसा नहीं कहा जा सकता है, कि आज नैतिक रूप में जो भी जहाँ उपस्थित है, वह समकालीन भी हो, जब कि सम सामयिकता केवल आसपास के परिवेश में उपस्थित मात्र है। युगधर्म या युग के जीवन मूल्य समसामयिक में या तो उपस्थित ही नहीं रहते या उपस्थित रहकर भी सरलकृत हो जाते हैं। इसलिए समकालीनता कालगत समर्पित या सम सामयिकता का पर्याय नहीं है। इसके परे समकालीनता में वर्तमान बोध के साथ ही अतीत और भविष्य का विवेक समतल बोध होता है। यह विशिष्ट वर्तमान बोध ही समकालीनता को अभिव्यक्ति देता है। समकालीन कविता में अपने समय की पहचान है, कविता में जो हो रहा है उसका सीधा खुलासा है। पढ़ने के परभाव वर्तमान काल का बोध होता है, क्योंकि इसमें वास्तविक आदमी का परिदृश्य है। इन कविताओं में अनुभवों की दृष्टान्तकता है। इन कविताओं में वर्तमान समाज के मूर्त तथा यथार्थ सन्दर्भों से जुड़ते हुए वर्णन पाये जाते हैं।

समकालीनता के सन्दर्भ में एक अन्य शब्द आधुनिकता भी विचारणीय है। आधुनिकता संपूर्ण समाज की नयी गतिविधियों की प्रक्रिया से प्रारंभ होती है। इन नयी गतिविधियों से नये सामाजिक मूल्य स्पष्ट होते हैं। जिन्हें आधुनिकता जीवन मूल्य कहा जा सकता है। आज कविता ने अपने भाव बोध को बदला है और काव्य रसानुभूति की अपेक्षा ज्ञानात्मक संवेदना जगाने लगा है। इस ज्ञानात्मक संवेदना के कारण कविता अपनी पूर्ववर्ती परम्परा से कई अर्थों में निम्न हो गयी क्योंकि समकालीनता की रुचि, दृष्टि, स्थितियों, दशाओं, सम्बन्धों, घटनाओं का उपरी स्तर पर न लेकर उनके परेक्ष, अतीत छिपे अर्गुल रूपों की तलाश करती है। उपरी बाह्य प्रकट को ज्यों का त्यों स्वीकार नहीं कर लेती। इसलिए समकालीन कविता की अपनी पहचान परम्परा से कुछ निम्न है।

समकालीन कविता का अबलोकन किया जाये तो हम देखते हैं कि उसमें उत्तर-व्यथा आते रहें हैं, समकालीन कविता अनेक अन्दोलनों से प्रेरित रही है। जब तक कविता अपने समय के साथ सामंजस्य स्थापित नहीं कर लेती तब तक इस तरह के उत्तर चढ़ाव आते ही रहते हैं। समकालीन कविता अज्ञेय और मुक्तिबोध की

PRINCIPAL

College Head



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कविता में विकलांग विमर्श

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'विमर्श' शब्द का एक अन्य विकसित अर्थ है - 'एक संधि दिल्में वीज का अधिक विकास होता है किन्तु कल प्राप्त होने के पहले वाग्रा' उपरिक्ता होने लगती है।' विमर्श आलोचना के क्षेत्र में होने वाला विकृत शब्द है। इसका शाब्दिक अर्थ विचार, विवेचन, परीक्षण, प्रतीक्षा, गुण-दोष की निगंसा (डेलीबेरेशन), परामर्श, तर्क, ज्ञान आदि है। भाषाविद् डॉ. विजयकुमार पाठक का मतव्य है कि 'वि' अक्षर, विचार और 'मर्श' परामर्श से समीकृत है। किसी विचार को केंद्रस्थ करने के लिए विद्वानों, समीक्षकों, संस्कारों, पाठकों से परामर्श लेना विमर्श का व्यंगिक है। इच्छीसवी सदी के शुरुआती दौर में विकलांग विमर्श उत्कर्ष पर ले जाने का उपक्रम डॉ. विनय पाठक के ही वंश की कला है। विकलांगों पर जनके लोगों ने लिखा है लेकिन उसे विमर्श का विधान बनाना डॉ. पाठक की ही निजता है। 'विमर्श' शब्द से विकसित 'विमर्शवादी' (ताकिक समीक्षक), 'विमर्शन' (परीक्षण / समीक्षा), 'विमर्शित' (विचारित / आलोचित) शब्द समीक्षा के अर्थ ही समीकृत प्रतीत होते हैं। स्पष्ट है कि, प्रत्येक विमर्श के साथ ऐसी आपदाएं आती हैं। यदि आलोचना, प्रचालोचना का शिलसिला न हो तो फिर 'विमर्श' का उद्देश्य ही समाप्त हो जाएगा। डॉ. विनयकुमार पाठक लिखते हैं यह निर्विवाद है कि साहित्य ही समाज में किसी विषय को महत्व व दिशा प्रदान करता है लेकिन कभी-कभी देसा भी होता है कि आवश्यक विषय छूट जाते हैं जिसे चुनौती के रूप में स्वीकार कर विधान के लिए निर्णय लेना होगा। प्रकृति सनाज एवं व्यक्ति विकलांगता की जननी है लेकिन विद्वान्ना यह है कि विकलांग प्रायः उपेक्षित-तिरस्कृत, अंतुहस्य, हास्य व दया का पात्र प्रमाणात होता है अनेक लोग उन्हें सिपाकर रखते हैं तथा घर के कोने में दूटे-फूटे बर्तन व फर्नीचर की तरह इन्हें रहवाहीन समझते हैं। विकलांगों को अंग विशेष के कारण अपूर्णता का च्युनता का बोध सहसा रहता है। इसके कारण उसके मन के किसी कोने में यह धारणा दृढ़ हो जाती है कि इरा अत्यन्ता की अपूर्णता संभवतः जीवन पर्यन्त न हो सके। उनको इरा उद्भाव को प्रतिभा, प्रोन्नति व प्रोत्साहन के

हाथ सहज संवेदनाशील होकर और आत्मसम्मान की सुरक्षा करते हुए क्रमशः परिष्कार का प्रयास करना हमारा जीवनोद्देश्य होना चाहिए। विकलांगों को केंद्र में रखकर साहित्य सृजन करना समय की मांग है। साहित्यकार ऐसे साहित्य का भी सृजन कर जो विकलांगों की व्यथा-कथा को निर्दिष्ट करें ही, उनके स्वभिमान को बनाए रखने के लिए और उन्हें मुख्य धारा में जोड़कर सफलताओं की तरह सम्मान से जीवन संवालिता करने का सुअवसर मिल सके। उनके दृष्टांत प्रेरणास्पद रहे हैं। ऐसे पात्रों को केंद्रस्थ करके साहित्यकार विविध विधाओं में लंघनी चलाकर संवेदना के नए क्षितिज को छू सकते हैं।

इसी प्रकार विविध साहित्य की विधाओं में से काव्य विधा में विकलांग विमर्श को देखते हुए राष्ट्रकवि डॉ. ब्रजेश सिंह के काव्य में विकलांग विमर्श देखेंगे। राष्ट्रकवि डॉ. ब्रजेशसिंह का रचना संस्कार अत्यंत वृहद् है। गद्य और पद्य दोनों विधाओं में डॉ. ब्रजेशसिंह के पवास से अधिक ग्रंथों का प्रणयन किया गया है। प्रमुख रूप से हिन्दी भाषा में ब्रजेशसिंहजी का लेखन है, लेकिन इसकी अलावा संस्कृत, छत्तीसगढ़ी, भोजपुरी, अंग्रेजी भाषा में भी लेखन किया है। विविध प्रकार की भाषा के माध्यम से लेखन करने के कारण इनके प्रतिभा का परिष्पय हमें प्राप्त होता है। राष्ट्रीयता पर दर्जनों ग्रंथ लिखकर राष्ट्रकवि के रूप में प्रतिष्ठि प्राप्त हुई है। डॉ. ब्रजेशसिंह के साहित्य में विकलांग विमर्श, अस्मिता, अभिव्यक्ति के रूप में उभरा है। पौराणिक, ऐतिहासिक यथस्वी विकलांग पात्रों के साथ ही दृढ़ इच्छाशक्ति के धनी वर्तमान विकलांग पात्रों की यशमाथा का अंकन कर डॉ. ब्रजेशसिंह समाज को विशेष संदेश देने में सफल सिद्ध हुए हैं। डॉ. ब्रजेशसिंह के काव्य साहित्य में कविता, मुक्तक एवं गजल में विकलांग-विमर्श अभिमुखित होकर उन्हें सम्मान से जीने तथा कुछ कर दिखाने का संदेश प्रेषित करता है। राष्ट्रीयता एवं सांस्कृतिक चेतना के पुनीत राष्ट्रीय यज्ञ में सम्मिलित विकलांग पात्रों पर डॉ. ब्रजेशसिंह की कलम जगकर चली है। राष्ट्रीयता के संदर्भ में विकलांग विमर्श को अपनी रचनाओं में कवि ने विशेष रूप से उकेरा है। विश्व की सबसे बड़ी दस हजार शैरों की महागजल 'समाधान' में विकलांग



हिन्दी साहित्य में नारी की स्थिति

डॉ. सी. अरुणा राजेंद्र शुक्ल
हिन्दी विभागाध्यक्षा, शोध निर्देशिका,
नॉट्स एज्युकेशन सोसायटी, सायन्स कॉलेज,
नांदेड, महाराष्ट्र

नारी मानव की सृजन-शक्ति, पालन पोषण को उत्तरदायिनी तथा उसके उन्नयन की एकमात्र आधार रही प्राचीन काल से वर्तमान काल तक उसकी स्थिति में अनेक परिवर्तन हुए। साहित्य में उसका चित्रण देखने पर सर्व प्रथम दृष्टि आदिकाल पर जाती है। नारी को दूरी कहनेवाले इस समाज में उसके दयनीय यत्न पार करती पड़ी है। धर्म प्रधान भारत धर्म में वेद, पुराण, स्मृति, इतिहास, दर्शन ने नारी को नर की अर्थांगिनी माना है। भारतियों की यह धारणा थी कि नारी के बिना पुरुष अधूरा है उसके बिना कोई भी फल पद वर्धन पूर्ण नहीं होता था। नारी को गृहलक्ष्मी माननेवाले भारतियों का विश्वास था कि उस घर को पर कहा जाता है जहाँ गृहिणी का निवास होता है। वैदिक काल में नारी को अत्यंत सम्मान किया जाता है। उस युग को आज भी स्मरण किया जाता है। उस युग में नारी पुरुष श्रेष्ठ समझी जाती थी। मातृसत्ताक गुरुत्व पध्दति होने के कारण नारी का सम्मान था। नारी उस समय वेद और शास्त्रों में पारंगत थी। इतना ही नहीं वह रचनाओं की भी रचना करती थी। उसका विवाह जल्दी नहीं किया जाता था। उसे पढ़ने के लिए गुरुकुल में भेजा जाता था। उसे अपने जीवन साथी चुनने का पुरा अधिकार था। उस युग में पर्दा पध्दति नहीं थी, विधवाओं का पुनर्विवाह होता था। कन्यापुत्र के समान प्रत्येक क्षेत्र की अधिकारिणी समझी जाती थी। पुत्र तथा पुत्री में किसी तरह का भेदभाव नहीं किया जाता था। नारी को वेदाध्याय सृजन तथा तपस्या

करने की पूर्ण स्वतंत्रता थी। नारी स्वतंत्रतापूर्वक समाज के प्रत्येक वर्ग में भाग लेती थी। समस्त युग में उग्रतर सशक्त महयोग रहा करता था। नारी का सबसे शक्तिमान रूप वैदिक काल में दिखाई देता है। उस युग में विश्वविद्यालय विदुषिका होकर रज गई। जिनमें लोपमुद्रा, मैत्रेयी घोष, गार्गी आदि हैं। सती जाना भी उस स्त्री की इच्छा पर निर्भर था। ए.एस. अल्तेकर लिखते हैं, "यदि विधवा स्त्री पति के साथ सती होना स्वीकार न करे तो उसके लिए अन्य तीन मार्ग खुले हुए थे। पहला यह कि वैधव्य जीवन व्यतीत करे। दूसरा अपने देवर या निकट के या पुनर्विवाह करे विधवा प्रथा के अंतर्गत स्त्री अपने पति के भाई यदि निकट के सम्बन्धों के साथ विवाह कर लेती या यौन सम्बन्ध में बंध जाती। यह प्रथा वैदिक काल में प्रचलित थी।"^१

वैदिक काल में स्त्री यज्ञ-कर्म में भाग लेती थी। पुत्र न होने पर पिता की संपत्ति की अधिकारिणी पुत्री को माना जाता था अर्थात् इस युग में स्त्री सहज मानव के रूप में स्त्रियत्व गुणों सहित समाहित थी। वह परिभाषण ढंग से जीवन यापन करती थी। दरअसल यह समाज मातृसत्ताक प्रधान था। संतान पिता के वंश या कुल से नहीं तो वह माता के नाम से परिवच पाता था। उपनिषदों में वर्णित पुत्र सत्यकाम और माता जाबला की कथा इसका श्रेष्ठ उदाहरण है। जिसमें पिता को अज्ञात रहना उसकी शिक्षा-दोषा में बाधक नहीं बनता लेकिन धीरे-धीरे नारी पर प्रतिबंध लगने लगे उसकी स्वतंत्रता समाप्त होगई और वह पुरुषों के हाथों सौंप दी गई। उत्तर वैदिक काल में दृष्टियों के हार के साथ मुद्द क्षेत्र में पकड़ी जानेवाली लडाकू नारीयों आर्य परिवार में दासी के रूप में शामिल हुईं। कुछ बहादुर स्त्रियों ने आर्यों के, दिल जीत लिए यही से आर्यों में बहुविवाह की प्रथा शुरु हुई। दासी प्रथा का भी प्रचलन हुआ इस काल में उन्हें पढ़ने के लिए गुरुकुल भेजना बंद हुआ। परंतु सामाजिक और धार्मिक कार्य में भाग लेने के लिए वह स्वतंत्र थी। पति चुनने का अधिकार उसे था। बौद्धिकता में वह पुरुषों के बराबर थी। परंतु धीरे-धीरे परिवर्तन आता गया। वह अपने पद से हटकर दासी के निम्नपद पर पहुँच गयी।



२. भारत की प्रथम अध्यापिका सावित्रीबाई फुले

डॉ. सौ. अरुणा राजेंद्र शुक्ल

शोधकर्ता, हिन्दी विभाग प्रमुख, शोधनिर्देशिका ना. ए. सो. सायन्स कॉलेज, नदिद.

सावित्रीबाई फुले का जन्म महाराष्ट्र के सातारा जिले के नायगाँव नामक स्थान पर ०३ जनवरी १८३१ इ.सन्. में हुआ था। उनके पिता का नाम खण्डोजी नेवासे और माता का नाम लक्ष्मीबाई था। इ.सन् १८४० में मात्र नौ वर्ष की आयु में ही उनका विवाह तेरह वर्ष के ज्योतिबा फुले से हुआ।

“महात्मा ज्योतिबा फुले स्वयं महान विचारक, कार्यकर्ता, समाज सुधारक, लेखक, दार्शनिक, संपादक और क्रांतिकारी थे। सावित्रीबाई पढ़ी-लिखी नहीं थी। शारी के बाद ज्योतिबा ने ही उन्हें पढ़ना सिखाना सिखाया। बाद में सावित्रीबाई ने ही दलित समाज की ही नहीं, बल्कि देश की प्रथम अध्यापिका होने का गौरव प्राप्त किया। उस समय लड़कियों की दशा अत्यंत दयनीय थी और उन्हें पढ़ने सिखाने की अनुमति तक नहीं थी। इस रीति को तोड़ने के लिए ज्योतिबा और सावित्रीबाई ने सन् १८४८ में लड़कियों के लिए एक विद्यालय की स्थापना की। यह भारत में लड़कियों के लिए खुलने वाला पहला स्त्री विद्यालय था। सावित्रीबाई फुले कहा करती थी “अब बिल्कुल भी खाली मत बैठे, जाओ शिक्षा प्राप्त करो” सावित्रीबाई स्वयं शिक्षित हुईं और महिला शिक्षा को मूर्तम को उन्होंने छोड़ी।” (सौताराम गुप्ता - सावित्रीबाई फुले की जिवनी- अच्छी खबर. कॉम)

उन्नीसवीं सदी के आरंभिक अन्य सुधारवादी आंदोलनों का संचालन पुरुषों द्वारा ही किया जाता था। ऐसे में अपवाद स्वरूप जो नाम सामने आता है वह वीरगंगा सावित्रीबाई फुले का ही है। वे अपने समय की एकमात्र महिला कही जा सकती हैं जिन्होंने अपने पति ज्योतिबा के साथ मिलकर न केवल पतियों व स्त्री शिक्षा के उत्थान के लिए सफल प्रयत्न किए बल्कि तत्कालीन सतीप्रथा, बालविवाह और अशिक्षा के विरुद्ध जमकर संघर्ष किया और विधवा विवाह व बेसहारा औरतों के रहने के लिए आवास गृह भी स्थापित करवाने जैसे सामाजिक कार्य करते हुए इनको क्रांतिकारी दिशा की ओर मोड़ा। सावित्रीबाई फुले भारत की प्रथम महिला अध्यापिका, समाज सेविका, कविपत्री और वचिर्ता की आवाज उठाने वाली सशक्त नारी मानी जाती हैं। सावित्रीबाई फुले एक ऐसे घर में जन्मी थीं, जहाँ पिता लड़कों के किताब उठाने तक के खिलाफ थे। इस बात की पुष्टि सावित्री के जीवन में घटी उस घटना से स्पष्ट होती है, जब वे एक बार अपने घर में बचपन में किसी अंग्रेजी किताब के पन्ने पृ. ही बालेहलकरा पलट रही थीं, तब अचानक उनके पिता ने उनको ऐसा करते देख लिया और उनको बहुत फटकार लगाई। इतना ही नहीं पुस्तक को छीनकर छिड़कने से बहर फेंक दिया, साथ ही दुबारा न पढ़ने की सख्त हिदायत भी दे डाली। उस समय सावित्री पढ़ना भी नहीं जानती थी और अध्ययन को महत्ता जैसे विषय की गूढ़ता को समझने की उनकी उम्र ही थी। पर कहीं न कहीं उस

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११. भाषा और संस्कृति : डॉ. विनोद बब्बर

पूनम सत्यनारायण शर्मा

शोधछात्रा, पीपल्स महाविद्यालय, नांदेड.

डॉ. सी. अरुणा राजेंद्र शुक्ल

हिन्दी विभागाध्यक्षा, शोध निर्देशिका, न. ए. सो. सायन्स कॉलेज, नांदेड.

भारतीय संस्कृति विश्व की संस्कृतियों में से सबसे प्राचीन और प्रमुख है। इसलिए इसका प्रभाव प्रायः सभी संस्कृतियों पर पड़ा। यूँ विश्व की सभी संस्कृतियों एक दूसरे से प्रेरित-प्रभावित होती रही है और आज भी वह क्रम जारी है। महात्मा गांधी ने कहा है - 'कोई भी संस्कृति जीवित नहीं रह सकती यदि वह अपने को अन्य से पृथक् रखने का प्रयास करे।' भारतीय संस्कृति की बड़ी विशेषता है कि इसने कभी किसी को आहत नहीं किया, बल्कि उसकी खुशियों को आत्मसात करके अपना बना लिया। वस्तुतः जो संस्कृति महान होती है, इससे दूसरों की संस्कृति को भय नहीं, वह उसको साथ लेकर पवित्रता देती है जैसे गंगा दूरारी नदियों के प्रवाह को अपने में मिला लेने के कारण ही पावन रहती है।

आचार्य हजारी प्रसाद द्विवेदी की मान्यता है कि 'महिमाशालिनी भारतीय संस्कृति का निर्माण ही भारतवर्ष में आई हुई निम्न-निम्न जातियों के सम्मिलित प्रयत्नों और प्रभावों से हुई विविधता में एकता और विरोधी परिस्थितियों में सामंजस्य स्थापित करने की क्षमता हमारी संस्कृति की सबसे बड़ी विशेषता है। उन्होंने भारतीय संस्कृति को समन्वयकारी प्रवृत्ति एवं उदारतावादी दृष्टिकोण से देखाफित करने का विशेष प्रयास किया है। धर्म, अर्थ और व्यवहार का सफल समन्वय करनेवाले गांधीजी के द्विवेदीजी अनुयायी रहे हैं इस कारण समन्वयवाद उनमें काफी मात्रा में मिलता है।'²

डॉ. विनोद बब्बर के निबंधों में उनके व्यक्तित्व की छाप दिखाई देती है तथा सांस्कृतिक चेतना प्रखरता से प्रकट होती है। निबंधकार के रूप में डॉ. विनोद बब्बर जी कहते हैं कि, किसी भी राष्ट्र का स्वरूप भूमि भूमिपर बसने वाले लोग और उनकी संस्कृति इन तीनों के सम्मिलन से बनता है। देश विपत्ती विरोध भू-भाग को कहा जाता है। उसके प्रति श्रद्धा, शक्ति और प्रेम का भाव ही वास्तव में राष्ट्रीयता है। राष्ट्रीय चेतना न रहने पर कोई भी देश अथवा सभ्यता-संस्कृति अपने अस्तित्व को बचाये नहीं रख सकती। संस्कृति और राष्ट्रीय एकता की मूलवाहक भाषा है।

दार्शनिक निबंधकार डॉ. विनोद बब्बर जी लेखनी राष्ट्रीय और महान मानवीय सांस्कृतिक चेतना से ओत-प्रोत हैं। राष्ट्रभाषा के प्रबल समर्थक विनोद बब्बर जी राष्ट्रवादी चिंतन धारा के प्रखर प्रवक्ता हैं। इनकी मान्यता है कि राष्ट्रीय एकता और अखण्डता के लिए भाषाई सांगनस्य और शौहार्द की आवश्यकता है। निबंधकार विनोद बब्बर ने अपने निबंध संग्रह 'भाषा और संस्कृति' में संस्कृति के उत्थान के लिए भाषा का अनन्य साधारण

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विनोद बब्बर : व्यक्तित्व और कृतित्व

पूनम सत्यनारायण शर्मा
शोधसूत्रा,
पीपल्स महाविद्यालय नांदेड

डॉ. सौ. अरुणा राजेंद्र सुगल
हिन्दी विभागाध्यक्ष, शोध निर्देशिका,
ना.ए.सो.सायन्स कॉलेज नांदेड

साहित्य की दुनिया में डॉ. विनोद बब्बर किसी परिचय के मोहताज नहीं हैं। उनका साहित्य राष्ट्रीय सचेतना का संवाहक है, इसे हम सात्साहित्य की संज्ञा भी दे सकते हैं। वे साफ-सपाट बात अपने विशिष्ट चुटकीले अंदाज से करने के आदि हैं। राष्ट्रीयता तो उनके व्यक्तित्व की पहचान है। सीखे व्यांग, कहानियाँ, लघुकथाएँ निबंध और अज्ञेय पाठक मन को भीतर तक झकझोर जाते हैं। राष्ट्रभाषा हिन्दी के प्रति उनका अनुराग स्तुत्य है। उनके चरित्र में राष्ट्रीयता, राष्ट्रभाषा के प्रति अनन्य श्रद्धा एवं रचनाधर्मिता का त्रिवेणी संगम है।

श्री विष्णु प्रभाकर के मतानुसार इनकी कहानियाँ मनुष्यता को बनाये रखने का प्रयास करती हैं। स्वर्ण एवं आत्मकेंद्रित पात्रों को फटकर लगाते हुए अनेकानेक सामाजिक विसंगतियों पर प्रहार करती हैं। विनोद बब्बर के पात्र जीवन के यथार्थ पर कोरी भावुकता से नहीं अपितु पूरी ईमानदारी से मानवीय रिश्तों की पड़ताल करते हैं।

सुप्रसिद्ध लेखक, चिन्तक, संपादक तथा भारतीय संस्कृति एवं मनीषा के प्रति पूर्णतया समर्पित श्री विनोद बब्बर अपनी निर्भीक अभिव्यक्ति के लिए ख्यातनाम हैं। अभिव्यक्ति-जनित ऐसी विधिकता

कम ही लेखक, पाठकों में स्वीकृत होते हैं। राष्ट्र भिन्न में जैसे भूमिका निभाते हैं वह अप्रतिम एवं अन्यो के लिए अनुकूलनीय है। उनके समाचार पर राष्ट्र भिन्न में से ही प्राप्त इनकी कहानियाँ एवं इनके विनामोलजक एवं मार्मिक निबंध भी उनके लेखन की उत्कृष्टता के साथी हैं।

जन्म :

लेखक कवि, पत्रकार विनोद बब्बरजी का जन्म प्रथम जलवाई १९५० को दिल्ली के मांगलरवा गाँव में हुआ। एक मध्यमवर्गीय परिवार जो देश विभाजन का दंश झेलते हुए स्वयं को स्थगित करने में लग्न हो वहाँ बचपन की मुठ-मुठिकाओं का न होना नियति है। संकुच परिवार और पाँच भाईयो में सबसे छोटे होने के कारण सवर्ण स्नेह का अधिकार पशु जिन्हे प्यार से दादा दादी ने यह नाम दिया यह विनोद बब्बरजी का सौभाग्य था।

विनोद बब्बरजी का बचपन दादी तथा माँ के प्रेम की छाया में तथा पिताजी के सक्त अनुशासन में गुजरा। परिवार का रहन-सहन साधारण होते हुए भी सेवा, संस्कारों, नियम, मर्यादा को उच्च प्राथमिकता दी जाती थी।

विनोद बब्बरजी का स्वभाव मृदु भाषी लेकिन विनोदप्रिय पाया जाता है। विनोद बब्बर की बचपन में ऐसा जादू है कि जो एक बार मिला, बार-बार खिंचा आता है। बातचीत में छोटे-छोटे प्रेरक उद्घरण, श्लोक, कविता, उर्दू के शेर तो मिलेंगे हाँ हसने मुस्कराने को विवश करते शालीन चुटकुलों का उनका विशिष्ट अंदाज भी मिलता है।

उनका पहनावा एक साधक जिनकी सिद्धियाँ निश्चय ही किसी परिचय को मोहताज नहीं। सादगी भर जीवन उच्च विचार की वे साक्षर प्रतिमूर्ति हैं। सामान्य कट, गेहूँआ रंग, भर शरीर, लम्बी दाढ़ी, विशाल ललाट, सिर के बालों में गाँठ। शांत गंभीर चेहरा, चुस्त आँखें सजगता की ग्वाही देती हैं। सादा कुर्ता पाजामा, पाँव में साधारण चप्पलें। सही अक्खड़ गुमककड विनोद बब्बर जी का व्यक्तित्व हमें दिखाई देता है।

विनोद बब्बरजी की संप्रति को देखते हुए -

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७. 'केशव आनंद' कृत हिमाचल का लोक
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८. साझा साहित्य, १९७९, पृ. २२

९. डोगरी लोकगीत, भाग-४, पृ. ११६

१०. श्रीमति बिगला कुठियाला कृत पर्वतीय
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११. डोगरी लोकगीत, भाग-१४, पृ. ४५

१२. डोगरी लोकगीत भाग-४, पृ. ६६

१३. हिमाचली लोकगीत भाग-१, पृ. १५५

१४. डोगरी लोकगीत भाग-१७, पृ. ४४

१५. डोगरी लोकगीत, भाग-१०, पृ. २१५

१६. डॉ. चमन लाल वर्मा कृत मण्डियाली
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१७. डोगरी लोकगीत, भाग-१२, पृ. ७९

१८. डोगरी लोकगीत, भाग-४, पृ. १८

१९. हिमाचल प्रदेश के संस्कार गीत, पृ. १५

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प्रकृति से साधात्कार इब्सन के देश में : डॉ. विनोद बब्बर

पूनम सत्यनारायण शर्मा
शोधज्ञान
पीपल्स महाविद्यालय, नरिड

डॉ. सी. अरुणा राजेंद्र शुक्ल
शोधालेख प्रस्तुति
हिन्दी विभागाध्यक्षा, शोध निर्देशिका
ना.ए.सो.सायन्स कॉलेज, नरिड

□□□

साहित्य के क्षेत्र में विनोद बब्बरजी का नाम उल्लेखनीय है। विनोद बब्बर कहानीकार, व्यंगकार, कवि, निबंधकार तथा पत्रकार के रूप में अपनी विशिष्ट पहचान रखते हैं। विनोद बब्बर देशभर में प्रसिद्ध खट्ट-किंकर नामक साप्ताहिक पत्रिका के संपादक भी हैं।

इब्सन के देश में एक महत्वपूर्ण यात्रा-संस्मरण है। इस संस्मरणात्मक यात्रा-वर्णन को पढ़ने के पश्चात् देश विदेशों में प्रमाण करने के शौकीन, अटक पर्यटक के रूप में रचनाकार की तस्वीर मन में उभरती है। पच्चीस अध्यायों में जहां शब्द-विश्र है वहीं अंतिम सोलह रंगीन पृष्ठों पर संपूर्ण नयों के दर्शन से ग्रंथ की उपयोगिता तथा आकर्षण अधिक बढ़ जाता है।

विनोद बब्बर एक चित्रकार भी हैं। अतः उनकी चित्रात्मक भाषा पैली का वैशिष्ट्य इस कृति में भी परिलक्षित होता है। यह यात्रावृत्त रेखाचित्र के तस्वीर निकट है कठिनाइयों पर विजयश्च उनका प्रथम एपीसोड है जिसमें लेखक ने फासपोर्ट एवं बीजा समस्याओं को शब्दशः अंकित किया है। दिल्ली से मास्को और फिर मास्को से ओस्लो के लिए हवाई

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सहायक- डॉ० अर्जुन चौहान, लेख- डॉ० डी०पी०
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१६. हरदोई: सांस्कृतिक गणेशटियर, (गणेशटियर-
२), पूर्वोद्गत, पृ. ६४.

१७. https://en.wikipedia.org/wiki/Battle_at_Machhiwara

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पंजाब के बलिदानी बंदाबहादुरसिंह- जीवनवृत्त एवं बलिदान

डॉ. अरुणा समेट मुख्त
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वा.ए.गो. शाबान कॉलेज गढ़वा, महाराष्ट्र (भारत)

अपना सर्वस्य तुटा कर राष्ट्रधर्म कैसे निभाया जाता है, अपने गुरु के पथनों को सर्वोपरि कैसे माना जाता है, और अपने दुश्मनों की आँखों में आँखें डालकर कैसे खाड़ा हुआ जाता है - बड़ अजर किसी एक इंसान से सीखना हो तो केवल गुरु गोविंद सिंह जी के धारे शिष्य बंदा सिंह बहादुर का ही नाम हमारे जुबान पर आता है। कहते हैं कि घोड़ा होने से पहले बंदा सिंह बहादुर एक बैरागी थे। तो आइये जानते हैं कि नियति ने बाबो दास जैसे बैरागी को भाई बंदासिंह बहादुर जैसे घोड़ा कैसे बना दिया और उन्होंने किस तरह से मुगलों को नाकों चने धक्का दिये थे।¹

बन्दा सिंह बहादुर बैरागी एक सिख सेनानायक थे। उन्हें बन्दा बहादुर, २ लक्ष्मण दास और भाबो दास ३ भी कहते हैं। ये पहले ऐसे सिख सेनापति हुए, जिन्होंने मुगलों के अक्षेप होने के क्रम को तोड़ा, छोटे साइबजादों की सहायत का बदला लिया और गुरु गोविंदसिंह द्वारा संकल्पित द्रमुल्लासंपन्न लोकराज्य की राजधारी लोहगढ़ में खालसा राज्य की नींव रखी। यही नहीं उन्होंने गुरु नानक देव और गुरु गोविंद सिंह के नाम से सिक्का और मोहरें जारी करके, निम्न वर्ग के लोगों को उच्च पद दिलाया और हलवाहक किसान-मजदूरों को जमीन का मालिक बनाया। मातृभूमि के धर सपुत्र के रूप में बन्दा सिंह बहादुर को जाना जाता है।

बाबा बन्दा सिंह बहादुर का जन्म कश्मीर स्थित पुंज जिले के तहसील राजौरी जन्मक्षेत्र में विक्रम संवत् १७२७, कार्तिक शुक्लपक्ष त्रयोदशी तिथी और दिनांक २७ अक्टूबर १९७० को हुआ था। बंदा बहादुर सिंह बैरागी ब्राह्मण परिवार से थे और उनका वास्तविक नाम लक्ष्मणदेव था। लक्ष्मणदेव के भ्रातृ में पिता नहीं थी, लेकिन छोटी सी उम्र में पहाड़ी जवानों की भाँति युवती और दिवंगत आदि का बहुत शौक था। वह पंद्रह वर्ष की

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अनुवाद के क्षेत्र में रोजगार की संभावनाएँ

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संसार में अलग-अलग भाषाएँ हैं। हर छोटी बड़ी भाषा का अपना जन समूह है। एक समय था कि हर भाषी जन समूह अपने में सीमित वाक्-व्यवहार द्वारा जीवन की सभी अस्तित्वों को वाक्य जी सकता था। परन्तु आज वैज्ञानिक, औद्योगिक विकास के दून में मात्र भाषा ही नहीं देश की सीमा-रेखा भी अस्पष्ट होती जा रही है। किसी भी देश का आदमी मात्र एक ही भाषा क्षेत्र में आसक्त बन कर जी नहीं पावेगा। उसका सम्बन्ध किसी न किसी रूप में अन्य भाषा-भाषी से अनिवार्य रूप में आयेगा ही। इसीलिए उसे एक सम्पर्क भाषा की जरूरत होती है। कोई देश-विदेश भी किस्मिता क्यों न हो, उसे अन्य देशों से सम्पर्क करना ही होता है; अतः वहाँ भी सम्पर्क भाषा की जरूरत महसूस होती है। राष्ट्रभाषा और अन्तर्राष्ट्रीय भाषा की अद्यतनता इसी वाक्-व्यवहार की आवश्यकता की उत्पत्ति है। सम्पर्क भाषा तथा अन्तर्राष्ट्रीय भाषा के निर्माण में अनुवाद की भूमिका महत्वपूर्ण होती है। इसीलिए अनुवाद आज की सर्वाधिक चर्चित और महत्वपूर्ण विधा है। रोजगारों के कामकाज से लेकर वैज्ञानिक-तकनीकी अध्यापन तक में अनुवाद की आवश्यकता होती है। ज्ञान-विज्ञान के इस सम्पुष्ट फल में अनुवाद की प्रामाणिकता को और अधिक स्पष्ट करने की आवश्यकता नहीं। भाषा, साहित्य, दर्शन, ज्ञान विज्ञान की वीथुडि में अनुवाद का महत्व अनन्य साधारण रूप में देखा जा सकता है। डॉ. भोलाकाश तिवारी के अनुसार एक भाषा में वाक्यविचारों को, यथा सम्भव जमान और सहज अभिव्यक्ति द्वारा दूसरी भाषा में व्यक्त करने का प्रयास अनुवाद है।¹

यथा प्रतिपत्ता इमानान्तरागतमप्यर्थं कार्यानार्थं प्रत्येकान् प्रतिपाद्यते तदानुवादो भवति।

अर्थात् किसी और प्रमाण से ही कही गई बात को ही दूसरे रूप में लिखे किसी द्वारा जब श्रोता से क्या जाना है तब

अनुवाद होता है। इस प्रकार अनुवाद अथवा प्रमाण संकृत में हुआ। सम्बन्ध रूप में अनुवाद का फल एक अर्थात् स्वयं भाषा में व्यक्त करना होता है। छोटे तौर पर कहना हो तो, किसी एक भाषा की सामग्री को दूसरी भाषा में स्थानांतरित कर देना ही अनुवाद होता है।

लांग्वेज ने अपने ग्रंथ अष्टाध्यायी में अनुवादे चरणानाम् कहा है जिसकी व्याख्या करते हुए यमु ने लिखा है The world anuvad means repetition by way of explanation, illustration, or corroboration, that is to say when a speaker demonstrates for some special purpose, a proposition which had already been demonstrated before that is called anuvad.²

हिन्दी में अनुवाद के लिए भाषांतर, भाषानुवाद, टीका, संपांतरण तथा तर्जुमा आदि शब्दों का भी प्रचलन है किन्तु ट्रान्सलेशन के पर्यायी शब्द के रूप में ये शब्द उत्तरे नहीं एवं कुचित संगत नहीं जान पड़ते जितना कि अनुवाद शब्द। अनुवाद में मूल पाठ अथवा विषय वस्तु के कथ्य तथा उद्देश्य की दृष्टि रक्षा की जाती है फिर जो मूल या स्वतंत्र भाषा में व्यक्त विचारों भावों को उलट रूप से दूसरी भाषा अर्थात् लक्ष्य भाषा में अभिव्यक्ति प्रदान की जाती है। संक्षेप में कहना हो तो स्वतंत्र भाषा के मूल पाठ के अर्थ एवं लक्ष्य भाषा के परिनिधित पाठ के रूप में संपांतरण कहना अनुवाद है।³

भारत में अनेक भाषाएँ बोली जाती हैं। वहाँ प्रत्येक प्रांत की अपनी-अपनी भाषा है। आठवीं अनुसूची के अनुसार आज भारत में 22 राष्ट्रीय भाषाएँ हैं। इन बहुभाषी देश में विचारों का आदान प्रदान करने के लिए एक संघर्ष या माध्यम भाषा की आवश्यकता है। भारतीय जनसमुदाय हिन्दी के माध्यम से विचारों का आदान-प्रदान करते रहते हैं। वैसे तो आज पूरी दुनिया तक छोटे बड़े के रूप में बदलती जा रही है। सूचना प्रौद्योगिकी की प्रगति ने हमें एक ऐसे मुकाम पर पहुँचा दिया है। जहाँ से विश्व के एक कोने से दूसरे कोने तक संघर्ष स्थापित करना आसान हो गया है। आज संपूर्ण विश्व में आपसी सहयोग, व्यापार और सांस्कृतिक आदान-प्रदान कर बढ़ी तेजी से विकास हो रहा है। नए-नए शोध व ज्ञान का विपुल भंडार आज किसी एक देश तक सीमित नहीं रह गया है बल्कि यह निरंतर विश्व के कोने कोने में अनुवाद के माध्यम से पहुँच रहा है। आज व्यापार, पर्यटन, उद्योग, चिकित्सा, प्रौद्योगिकी, साहित्य, सांस्कृतिक संबंधों में प्रितानी तेजी-तेजी परिवर्तन हो रहा है जहाँ ही-जहाँ से अनुवाद की आवश्यकता बढ़ती जा

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पंजाब के बलिदानी बंदाबहादुरसिंह- जीवनवृत्त एवं बलिदान

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अपना सर्वस्व लुटा कर राष्ट्रधर्म के लिये निष्ठा जाता है, अपने वृत्त के चरणों को सर्वोपरि कैसे माना जाता है, और अपने दुश्मनों की आँखों में आँसू डालकर कैसे अज्ञात हुआ जाता है - यह अगर किसी एक इंसान से सीखना हो तो केवल मुक्त मोर्चिद सिंह जी के प्यारे शिष्य बंदा सिंह बहादुर का ही नाम हमारे जुबान पर आता है। कहते हैं कि बंदा सिंह बहादुर के बड़े बंदा सिंह बहादुर एक पैगम्बी थे। तो आइये जानते हैं कि निष्ठा में माथो दास जैसे पैगम्बी को कोई बंदासिंह बहादुर जैसे बंदासिंह कैसे बना दिया और उन्होंने किस तरह से मुसलमानी नाकों को चकवा दिये थे।'

बंदा सिंह बहादुर पैगम्बी एक सिद्ध सेवकनाटक थे। उन्हें बन्दा बहादुर, २ लक्ष्मण दास और माथो दास ३ भी कहते हैं। वे पहले ऐसे सिद्ध सेवकपति हुए, जिनहोंने मुसलमानी के अश्रेय होने के वन को तोड़ा, छोटे सड़कबजारों की सहायता का बहाना दिया और मुक्त मोर्चिदसिंह द्वारा संकरीणा प्रमुसलमानोंपर लोकराज्य की सहायता लोहगढ़ में छातया राज्य की नींव रखी। यही नहीं उन्होंने मुक्त नालक देव और मुक्त मोर्चिद सिंह के नाम से सिक्का और मोहरों जारी करके, निम्न पर्य के लोगों को उग्र्य पर दिलाया और हलबलक किसान-मजदूरों को जमीन का मालिक बनवाया। राष्ट्रधर्म के वीर समूह के रूप में बन्दा सिंह बहादुर को जाना जाता है।

कहा गया कि बहादुर का जन्म कानौर स्थित पृथ्वी सिंह के सहस्राल राजाजी जन्मशेख में विद्वान संघत् १७१७, कार्तिक शुक्लपक्ष प्रचोदारी तिथी और दिनांक २७ अश्विन ११७० को हुआ था। बंदा बहादुर सिंह पैगम्बी ब्राह्मण परिवार से थे और उनका वास्तविक नाम लक्ष्मणदेव था। लक्ष्मणदेव के श्राप में दिया नहीं की, लेकिन छोटी सी उग्र में पहाड़ी अथवा की शक्ति कुरती और शिकार आदि का बहुत शौक था। यह बंदासिंह एवं की



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अनुवाद के क्षेत्र में रोजगार की संभावनाएँ

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संसार में अनगिनत भाषाएँ हैं। हर छोटी बड़ी भाषा का अपना जन समूह है। एक समय था कि हर भाषी जन समूह अपने में सीमित वाक्-व्यवहार द्वारा जीवन की सभी जरूरतों को पकड़ जी सकता था। परन्तु आज वैज्ञानिक, प्रौद्योगिक विकास के युग में मात्र भाषा ही नहीं देश की सीमा-रेखा भी अस्पष्ट होती जा रही हैं। किसी भी देश का आदमी मात्र एक ही भाषा क्षेत्र में आश्रय धन कर जी नहीं पायेगा। उसका सम्बन्ध किसी न किसी रूप में अन्य भाषा-भाषी से अनिवार्य रूप में आयेगा ही। इसलिए उसे एक सम्पर्क भाषा की जरूरत होती है। कोई देश-किना भी विश्वीय क्यों न हो, उसे अन्य देशों से सम्पर्क करना ही होता है, अतः यहाँ भी सम्पर्क भाषा की जरूरत महसूस होती है। राष्ट्रभाषा और अन्तर्राष्ट्रीय भाषा की अवधारणा दूसी वाक्-व्यवहार की आवश्यकता की उपज है। सम्पर्क भाषा तथा अन्तर्राष्ट्रीय भाषा के निर्माण में अनुवाद की भूमिका महत्वपूर्ण होती है। इसलिए अनुवाद आज की सर्वाधिक ध्वजित और महत्वपूर्ण विधा है। रोजगार के कामकाज से लेकर वैज्ञानिक-तकनीकी अध्यापन तक में अनुवाद की आवश्यकता होती है। ज्ञान-विज्ञान के इन सम्पन्न कक्ष में अनुवाद की प्रासंगिकता को और अधिक स्पष्ट बनने की आवश्यकता नहीं। भाषा, साहित्य, दर्शन, ज्ञान-विज्ञान की शीर्षक में अनुवाद का महत्व अनन्य साधारण रूप में देखा जा सकता है। डॉ. मोस्तानाथ त्रिवारी के अनुसार एक भाषा में व्यक्तविधियों को, पया सम्भाव समान और सहज अभिव्यक्ति द्वारा दूसरी भाषा में व्यक्त करने का प्रयास अनुवाद है।

यदा प्रशिफला प्रमाणान्तजनमतमवर्षा कर्त्तान्तर्यं प्रयोक्ता
श्रित्वाद्यत्ते तदानुवादो भवति।

अर्थात् किसी और प्रमाण से ही कही गई बात को ही दूसरे कार्य के लिए किसी द्वारा तब बोला से कहा जाता है तब

अनुवाद होता है। इस प्रकार अनुवाद शब्द का प्रयोग संस्कृत में हुआ। समन्वय रूप से अनुवाद का कार्य एक अर्थहीन खोले भाषा में व्यक्त करना होता है। मोटे तौर पर कहना हो तो, किसी एक भाषा की सामग्री को दूसरी भाषा में स्थापित कर देना ही अनुवाद होता है।

पार्लिनी ने अपने ग्रंथ अष्टाध्यायी में अनुवाद चरलानाम् कहा है जिसकी व्याख्या करते हुए वायु ने लिखा है The world anuvad means repetition by way of explanation, illustration, or corroboration, that is to say when a speaker demonstrates for some special purpose, a proposition which had already been demonstrated before that is called anuvad. २

हिन्दी में अनुवाद के लिए भाषांतर, भाषानुवाद, टीका, संपादन तथा तदनुया आदि शब्दों का भी प्रचलन है किन्तु ट्रान्सलेशन के पारसी शब्द के रूप में वे शब्द अपने सही एवं युक्ति संगत नहीं मान सकते जितना कि अनुवाद शब्द। अनुवाद में मूल पाठ अथवा विषय वस्तु के सत्य तथा उद्देश्य की पूरी रक्षा की जाती है किन्तु उस मूल या स्रोत भाषा में व्यक्त विचारों भावों को सहज रूप से दूसरी भाषा अर्थात् लक्ष्य भाषा में अभिव्यक्ति प्रदान की जाती है। संक्षेप में कहना हो तो स्रोत भाषा के मूल पाठ के अर्थ को लक्ष्य भाषा के परिनिश्चित पाठ के रूप में स्थापित करना अनुवाद है। ३

भारत में अनेक भाषाएँ बोली जाती हैं। यहाँ प्रत्येक प्रांत की अपनी-अपनी भाषा है। आठवीं अनुसूची के अनुसार आज भारत में २२ राष्ट्रीय भाषाएँ हैं। इस बहुभाषी देश में विचारों का आदान-प्रदान करने के लिए एक संयुक्त वा माध्यम भाषा की आवश्यकता है। भारतीय जनसमुदाय हिन्दी के माध्यम से विचारों का आदान-प्रदान करने लगे हैं। वे जो आज पूरी दुनिया तक छोटे बड़े के रूप में बदलती जा रही है। सूचना प्रौद्योगिकी की क्रांति ने हमें एक ऐसे मुकाम पर पहुँचा दिया है। जहाँ से विश्व के एक कोने से दूसरे कोने तक संघर्ष स्थापित करना आसान हो गया है। आज संपूर्ण विश्व में अपनी सहयोग, व्यापार और सांस्कृतिक आदान-प्रदान कर रही तेजी से चिखल हो रहा है। नए-नए शोध व ज्ञान का विपुल भंडार आज किसी एक देश तक सीमित नहीं रह गया है बल्कि यह निर्गत विश्व के कोने कोने में अनुवाद के माध्यम से पहुँच रहा है। आज व्यापार, पर्यटन, उद्योग, शिक्षा, प्रौद्योगिकी, साहित्य, सांस्कृतिक संघर्षों में जितनी तेजी-से परिवर्तन हो रहा है उतनी ही तेजी से अनुवाद की आवश्यकता बढ़ती जा



स्वाधीनता आंदोलन और हिंदी काव्य

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स्वतंत्रता आंदोलन भारतीय इतिहास का वह युग है, जो पीडा, कटवाहट, दंभ, आत्म सम्मान, गर्व, गौरव तथा सबसे अधिक शहीदों के लहू को सपेटे है। स्वतंत्रता के इस महायज्ञ में समाज के प्रत्येक वर्ग ने अपने-अपने तरीके से बलिदान दिए। इस स्वतंत्रता के युग में साहित्यकारों और लेखकों ने भी अपना बहुत योगदान दिया। हमारे देश में अंग्रेजों ने अपना अधिपत्य बना रखा था उनको भगाने में कलय करतों ने अपनी भूमिका बड़ी बखूबी से निभाई। क्रांतिकारियों से लेकर देश के आम लोगों तक के अंदर लेखकों ने अपने शब्दों से जोश भरा। विविध साहित्यकारों में जैसे उपन्यासकार, नाटककार, निबंधकार, चक्रकार, देश के बहिष्कार इन सभी का योगदान रहा है। इन सभी के लेखन ने आम जन में राष्ट्रप्रेम की भावना जगाने में कारगर सिद्ध हुई है। इन विविध साहित्यकारों में से कवियों ने अपनी कविता से लोगों में देश प्रेम की ऐसी अलख जलाई कि लोग अपने घरों से बाहर निकल आए और क्रांतिकारी स्वतंत्रता आंदोलन में हिस्सा लिया। भारत में स्वाधीनता संग्राम का इतिहास उतना ही पुराना है जितना कि हमारी परतंत्रता का इतिहास। यह देश हजारों वर्षों से भी अधिक समय तक मुलाम रखा, परंतु इसका सांस्कृतिक स्वरूप अक्षुण्ण बना रहा। भारत की राष्ट्रीयता का अर्थपर राजनीतिक एकता न होकर सांस्कृतिक एकता रही है।

भारतेंदु हरिश्चंद्र ने जिस आधुनिक युग का प्रारंभ किया, उसकी जड़े स्वाधीनता आंदोलन में ही थीं। भारतेंदु और भारतेंदु मंडल के साहित्यकारों ने युग जेलना को पक्ष और गण दोहों में अभिव्यक्ति दी। इसके साथ ही इन साहित्यकारों ने स्वाधीनता संग्राम और सेनानियों की भूर-भूरी प्रशंसा करते हुए भारत के स्वयंम अतीत में लोगों की जागृता जगाने का प्रयास किया। वहीं दूसरी ओर उन्होंने अंग्रेजों की शोचकारि नीतियों का खुलकर विरोध किया। भारतेंदु हरिश्चंद्र ने महायुगपूर्व भूमिका स्वतंत्रता आंदोलन में निभाई। अंग्रेजों द्वारा निधि है भारतीय जनता पर कुत्नों सितम व नूट का नूट का उन्होंने बड़-बड़कर विरोध किया है। उन्हें इस बात का शोक था कि अंग्रेज वहाँ से सारी संपत्ति नूट कर विदेश ले जा रहे थे। इस नूटपाट और भारत की बर्हाली पर उन्होंने काफ़ी कुछ लिखा। 'अंधेर नदरी चौपट राजा' नामक अंग के माध्यम से भारतेंदु ने तत्कालीन राजाओं की निरंकुशाता, अंधेर नदरी और उनकी भूखंता का सटीक वर्णन किया है। अपनी भावना को व्यक्त करते हुए उन्होंने लिखा है-

"भीतर भीतर सब रस चुरी, हँसी हँसी के लन मन छन चुरी।
जोहिर कातिल मैं अडि तेज, क्यों सधि सज्जन, न सधि अंधरेजा।" 1
राष्ट्रीय काव्यधारा को विकसित करने वाली सुभद्रा कुमारी चौहान का विद्यारा और 'युवक की राधी', 'शाली की राधी', 'चीरो का कैमा हो कलत' आदि कविताओं में लीखे भावों की पूर्ण भावना लुभरित है। उन्होंने असहयोग आंदोलन में सक्रिय भूमिका निभाई। आंदोलन के दौरान उन्हें कई बार जेल जाना पड़ा। जालियाँवाला बाग में 'बलंत' कविता में इस नृशंख हत्याकांड पर कश्चिपी के कारण अंग से उसके मुक वेदना मूर्तिमान हो उठी है-

"आजो थिय अतुपाज, किंतु धीरे से आना
यह है लोक स्वान, यहाँ मल शोर मचाता।

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Abstract

This paper attempts to describe need of holistic approach in academic libraries. Experience based on more than twenty five years of library services specially in academic sector and position of readers particularly students thought crept in mind to narrate the things and bring to the notice of library professionals and academicians so that their mind will divert towards this theme. It may help to create effective awareness among readers, to be more critical and promote users to learn more from the library. Considering this need some aspect of holistic approach are discussed in the paper and accordingly some suggestions are given such as appreciation of library employees for good services, readers cooperation, staff involvement etc.

Keywords: Holistic approach, Readers, Library staff, Services, Personality development.

Introduction

Dictionary meaning of holistic approach is dealing with or treating a whole of something and not just only a part. It means taking care of something totally in all aspects.

Holistic approach encompass maximum possible aspect that helps to be a complete personality in respect of education, culture, social, productive to contribute for the well being of society at national and international level. This approach is comprehensive as it covers maximum possible things needed for overall development of an individual. Holistic approach is an individual philosophy based on the criteria or parameter that each aspect finds identity, meaning and purpose in life through connection to the community, natural world and human values. It is the soul of any activity that help to brings people together on common platform. According to Kshama Pandey and Niitu Singh (2013) holistic vision includes a sense of whole person who is connected to his or her surrounding context and environment. Library staff should have keen interest in engaging and developing the whole reader. Different could be physical, emotional, mental and spiritual. (<http://www.co.in> accessed on 10/5/2019).

Since Holistic Approach is an effective means, it deals all aspects about overall development of individual thus it helps to identify the appropriate research problem. Therefore identification of correct research problems leads to find feasible measures to overcome obstacles which is the ultimate aim of any research.

Strategy of Holistic Approach involves understanding a system. Attempt to develop and maintain multiple perspectives and further apply holistic approach towards complete promotion of an individual and group of people.

Benefits of Holistic Approach

Holistic approach helps to strengthen healthy relations between service providers and service seekers. It identify strength, weakness, interest, reluctant nature, attitude etc. of the individual and group of people and controlling measures can be applied. Holistic approach also changes the mindset of service provider and transforms them to more generous.

kind and helpful to one and all and thus they contribute more in their respective areas.

Review of Literature

Belousa I and Stakle A (2004) have discussed importance of holistic approach in higher education. According to them it helps in understanding of person and sustainable development of society and leads in creating sense of democracy in community.

Miller R (2000a) stated that holistic education is concerned with life experiences, not with narrow defined 'basic skills'. This means holistic approach is more than education.

Patel N V (2003) opinions, holistic approach develops students to be critical, confident and independent. It aims to make learning a process of self improvement and helps to recognise self in social context.

D'souza Anjali (2017) advocated in 'whole person education: An Indian perspective' - seducation should not be limited to make students academically sound but it should be balanced healthy psychology, emotionally and physically.

Taking into consideration aspect of holistic approach and review of above studies researcher feels that the concept of holistic approach could be applied through libraries in more effective way and that too with large number of readers specially students. Because libraries have key role in educating users and besides libraries are open for more hours than class room teaching. Library possesses huge diversified collection and this enables users, to choose books of their interest. Motivation to readers to visit library and staff attachment could strengthen holistic approach effectively.

Libraries and Holistic Approach

Libraries irrespective of their types are fundamentally established for intellectual development of reader's. It is the prime responsibility of all libraries. Technically focusing only on routine and formal services, being remaining in framework of rules, regulations, discipline these all are not



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ROLE OF LIBRARY WITH READING ROOM HELPS FOR DEVELOPMENT OF RURAL AREA

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Abstract

This paper attempts to highlights the role of libraries in rural development. Present status shows education system of rural area has become poor because of inadequate policy, negligence approach of govt and illiteracy of villagers. Realizing the importance of library with well equipped reading room has been suggested as a proposed solution for educational development of rural area. Financial support of villagers, college students & staff for years can contribute a lot for development of healthy educational environment in rural area. Further after achieving the target govt should take responsibility of salary grant for well function of the library and Reading room.

Key words : Education, development, village Library, financial support, college students and staff,

Introduction :

Basically India is the country of agriculturist. Seventy percent plus population of India depend upon agriculture. More than 5 lakhs villages distributed all over the country. Since the independence government has made lot of efforts to develop rural area with respect of agriculture, education, small scale and large scale industries, public sectors, transports etc. But to date no government has been success in achieving target completely. Education is the base instrument for development of all kind of sectors. In the beginning just after independence govt. had to focus on agriculture as there was shortage of food. That has been fulfilled to some extent by the green revolution nearly in two decades. Then the focus was shifted towards defense sector for self protection when late Mrs. Indira Gandhi was the prime minister and then after concentration was given for development of education around 1970 onwards. Later late Mr. Rajiv Gandhi, Prime Minister of India boosted through extensive use of computer technology.

Education is the key factor for development skill, knowledge new ways of doing task understanding of concepts etc. which every one of us accepts. Considering the growing importance of education govt of Maharashtra is being constantly trying to improve the status of education through various schemes such as - 'Sarve Shiksha Abiyan', 'Adult Education' Night Schools and colleges and Open Universities etc. But to-date improvement of education did not take place up to the expectation. This is not happened only because of missing and negligence of library factor libraries in all these systems. Govt. has adopted new economic policy from the year 1991 and promotion of privatization of education has been started growing at faster rate. Govt role shows it has been trying very carefully and safely to escape from her prime responsibility of education. That is why private schools and professional colleges have been opened at large number. The concept of education for all has been shifted to education for richer class of the society. Strength of students studying in ZP and govt aided colleges is declining at faster rate. This is the big damage to entire education system. Recruitment

DIRECTORY OF OPEN ACCESS JOURNALS (DOAJ): AN OVERVIEW**Dr. S. L. Jadhav¹**

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Abstract

DOAJ is an open database or e-journals started in 2003. This paper attempts to explain it in brief to users, students, research and faculty. Purpose of this paper is to create awareness about DOAJ among users and to promote its users. Paper also highlight its origin and development, mission, objectives, constitution, team, guideline to author, steps of indexing journals in DOAJ, features, benefits, participated publishers and update details revised etc are explained in brief. Overall status of the database shows that this is appropriate, standard and qualitative database now made available in 80. languages. 133 countries have participated in the project.

Key words : DOAJ, Open e-Resources, users, library staff, e-publications.

Introduction :

Staff/professionals of academic libraries are experiencing changing style of users of accessing information from 2005 onwards. Users are preferring e-Resources than print documents. Users even faculty are not visiting libraries. Books are just lying on shelves. This situation has left space for rethinking whether the efforts taken on acquisition, automation and processing will be beneficial or not in the future if the use of print documents is continued to come down. .

Same time many professionals have focused on preparing various databases of their concern fields. To quote some examples of databases like Agricola, AGRIS, INIS, MEDLAR, INSPEC, CAB, CeRA, etc. Later on 2000 onwards new databases have come up such as NLIST, DOAJ, American Society of Mechanical Engineers (ASME), ASCE (American Society of Civil Engineers), Springer nature, science direct, JGATE, EBSCO etc

Types databases / e-Resource : Databases includes two types. One is commercial means subscribed payment based and other is open means available at free of cost. CeRA, CAB, N-LIST are the examples of subscribed e-Resource and DOAJ, NOPR, Amazon Kindle Free e-Book Collection. Free classics and out-of-copyright, Kindle, Barnes & Noble Free eBooks, Google books, internet archives, digital library are the examples of open e-Resource

Open e-Resources are also of equally important and useful to users..There is no space for doubt about quality and standards of open e-Resources. With regards to its access it notices that e-Resources are easy to access as there are no more steps and need of pass word and verification process. As compare with other e-Resources DOAJ seems to be most common. Keeping in view the status and use of DOAJ this database has been selected for study. Purpose behind this is paper is to create awareness at mass level among user community and help to



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INFRASTRUCTURE REQUIREMENT FOR ICT BASED SERVICES IN LIBRARIES**Shri. Ganesh S. Ghatole**

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Abstract

This paper attempts to present an infrastructure required for ICT based electronic libraries. Purpose of this paper is to aware library staff about electronics devices used in computerization, database management in electronic libraries and other supportive gadgets. So that library staff will find convenient, familiar and motivating to work in ICT environment. Keeping in view library staff at the centre concept of electronic library, hardware and software requirement, offline and online e-Resources, storage devices with their specifications are discussed in brief in the paper. Hope that this paper will be useful to staff of library and will also help them to explain to their authorities while demanding the requirements for development of electronic / digital libraries.

Key words: Electronic library, e-Infrastructure, supportive devices, library staff, e-Resources & e-Services.

Introduction:

20th century has experienced role of traditional libraries in education and society. Library movement after independence of India received focused attention for systematic development and introduced computerization process for effective bibliographic control over library collection, speedy services to users and management of variety of services. Last decade of the century brought Internet and Windows have made possible to develop electronics and complete ICT based libraries since the beginning of 21st century.

Electronic Library:

Electronic libraries need infrastructure such as - Hardware, Software, supportive furniture, storage devices, Power Batteries, Network connection and planning to IT enabled services in libraries and also ICT trained staff.

Electronic libraries are of two types i.e. Offline and Online libraries. Online libraries also called digital and, virtual libraries. Digital libraries in views of experts are explained as under.

Lynch & Garcia - Molina (1995) says that "digital library is a system that provides a community of users with coherent access to a large organized repository of information and knowledge".

Waters, (1998) says "digital libraries are organizations that provide the resources, including the specialized staff, to select, structure, offer intellectual access to, interpret, distribute, preserve the integrity of and ensure the persistence over time of collections of digital works so that they are readily and economically available for use by a defined community or set of communities".




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INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Use of N-List & DOAJ e-Journals in Science College Nanded: A case study

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Abstract

Present study attempts to study the use of N-List and DOAJ e-Resources by users of Science College Nanded. Few enquiries were made to check the use of database i.e. e-journals. Purpose of the study was to know usefulness, coverage of e-Journals and feedback of its users. Survey method was adopted to gather data and opinion of respondents. This study was limited to respondents of science field of science. In the study it was found that users are well aware about N-List database than the DOAJ and also they find N-List is more convenient for use. Coverage of N-List is wide than DOAJ. On the basis of the study few recommendations are suggested by the researchers which includes, There is a need to look in to the matter personally by the Heads, Librarian and professionals to promote use of these e-resources. Organize regular workshops to make effective awareness about DOAJ among the research scholars and students.

Key Words : Comparative study, N-List & DOAJ, Users, Science faculty, e-Resources

Introduction : Present scenario of traditional resources shows that cost of printed documents i.e. books and periodicals is increasing every year. Even after acquiring such type of literature it is not possible to serve all users at mass level distributed in different geographical areas. Realising this problem information scientists, professionals and publishers have made attempt to create database of their concern fields. This has become possible because of availability of internet at reasonable cost. The practice of developing database was emerged around 1970 onwards. To quote some examples of databases like Agricola, AGRIS, INIS, MEDLAR, INSPEC, CAB, CeRA J-Gate, Science Direct etc. Later on 2000 onwards new databases such as NLIST, DOAJ, American Society of Mechanical Engineers (ASME), ASCE (American Society of Civil Engineers), have come up.



Role of Government Funding in Research & Publications

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Abstract: Present study deals with the role of Govt. Funding such as fellowship, scholarship, grants, schemes, FIP in research and publications. The study analyzes and examines the impact of funding in research and publications. In India many funding agencies disburse funds to the research scholars through online and offline mode. Before 2014 such funds were use to disburse only by offline mode. After receiving scholarship, fellowship research scholars can start research work otherwise it is not possible.

Keywords: Fellowship, Scholarships, Grants, Schemes and FIP.

Introduction: Human Resource Development Ministry, Govt of India gives financial support under different schemes in order to promote higher education specially research. Focusing on this good number of research scholars opt benefits of such funds known as fellowship, scholarship, grants, schemes and FIP etc. This financial support plays an important role in completing research process successfully otherwise it is not possible to maintain the quality and standards of research. Hence whatever amount of fund sanctioned for research should be strictly utilized for this purpose only. However it seems there is doubt whether the sanctioned amount has been utilized or not is the issue needs careful and detailed study. How much amount of scholarship, fellowship they spend in research and publications is matter of study. In continuing this study it is better to understand various concepts and terms used for financial support.

Scholarship: In the Cambridge dictionary it is defined as "an amount of money given by a school, college, university or other organization to pay for the studies of a person with great ability but little money".

Fellowship: In the Cambridge dictionary it is defined as "an amount of money that is given to postgraduates to allow them to study a subject at an advanced level". It means that, this is the monetary award given to research student on merit base for pursuing higher education.

Review of Literature: Larivière Vincent (2013): The topic of his study is "Ph. D. students' excellence scholarships and their relationship with research productivity, scientific impact, and degree completion". In this study he studied that relationship between excellence scholarships and scientific impact, research productivity and degree completion. He observed that funding provided to the students were published more

research papers than unfunded students. In his paper he concluded that students funded by federal scholarships obtain significantly large impact scores than those funded by the provincial government. He suggests that integration of students in to research, measured by the participation in peer-reviewed papers has a more pronounced influence on graduation rates than scholarships. When government provides more scholarships to students then the effect is increasing graduation rate and increasing the research capacity of the country.

Turnbaugh, S. L., & et.al, (2014). The title of the their paper is "Benefits of Research Fellowships for Undergraduates with Disabilities". The aim of the study is to contribute to the understanding of how students with disabilities experience and benefit from mentored research opening in the STEM (Science, Technology, Engineering and Mathematics) field. At first students learn about Undergraduate Research Fellowships (URFs) through PPT in their classes, at workshops, conferences and through faculty members.

In this study they uses survey method to collect data through questionnaire, who had received the research fellowship. In the result, there are 42 students with disabilities who are participated in research fellowships at USM. Out of them 68% were male students and 33% were female. In these students many students had variety of disabilities like emotional disability, attention-deficit disorders and physical disabilities.

Recommendations included having more openings to meet with other research fellows to interact and share their experiences, being given clear deadlines and being able to access writing support.



A Systematic Study on the Impact of GST on Sports

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Prof. Dr. Ashwin P. Borikar

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Abstract

The Goods and Services Tax has revolutionized the Indian taxation system. The GST Act was passed in the Lok Sabha on 29th March, 2017, and came into effect from 1st July, 2017. It is expected that GST will improve the collection of taxes as well as boost the development of Indian economy by removing the indirect tax barriers between states and integrating the country through a uniform tax rate. GST with its different slab rates has an impact on different fields and sectors. Through this research paper, the researcher wants to highlight some of important points related to impact of GST on physical education or sports field.

Introduction

The Goods and Services Tax was launched at midnight on 30 June 2017 by the Prime Minister of India, Narendra Modi. The launch was marked by a historic midnight (30 June - 1 July) session of both the houses of parliament convened at the Central Hall of the Parliament. Though the session was attended by high-profile guests from the business and the entertainment industry including Ratan Tata, it was boycotted by the opposition due to the predicted problems that it was bound to lead to for the middle and lower class Indians. It is one of the few midnight sessions that have been held by the parliament - the others being the declaration of India's independence on 15th August 1947, and the silver and golden jubilees of that occasion.¹

Goods & Services Tax Law in India is a comprehensive, multi-stage, destination-based tax that will be levied on every value addition.

In simple words, GST is an indirect tax levied on the supply of goods and services. GST Law has replaced many indirect tax laws that previously existed in India.

Advantages of GST

- Removing cascading tax effect
- Lesser compliances
- Defined treatment for e-commerce
- Higher threshold for registration
- Composition scheme for small businesses

Socio-Economic Impact of GST - 34



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Investigation of Before-Competition State Anxiety of Baseball Players

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Research Paper - Physical Education

Introduction :

Anxiety plays a paramount role in sports. It is the challenge in sports participation, which produces anxiety. How an athlete handles the anxiety determines how successful he would be? Anxiety may be a positive motivating force or it may interfere with successful performances in sports events. Anxiety is likely to be greater in higher competitive sports than in relatively noncompetitive sports, because in the competitive sports, participants are expected to win and greater demands are made upon them to succeed. The purpose of the study was to investigate the Before-competition state anxiety of inter collegiate players. It was hypothesized that there will be no significant difference between pre - competitive anxiety of winner and loser - baseball player in both male and female categories.

METHODOLOGY

Forty-five Baseball players who participated in Inter collegiate baseball Tournament held at Delhi University were randomly selected to serve as subjects for this study. Out of the 27 men baseball players, 18 players were those whose teams qualified to participate in the Semi Final matches and 27 players were those who participated from their teams in their pre Quarter finals. Out of the 18 women baseball players, 09 players were those whose teams qualified to participate in the Semi Final matches and 27 players were those who participated from their teams in their pre Quarter finals. The men and women baseball players who participated in any of their matches from their teams from pre Quarter final, were randomly selected for the study.


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Well-Balanced Diet Plan to Boost your Immunity

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Research Paper - Phy. Education

Introduction :-

Currently Covid-19 pandemic is a leading challenge across the globe. It is mandatory to attain and maintain good nutritional status to fight against virus. Nutritional status of individual is affected by several factors such as age, sex, health status, life style and medications. Nutritional status of individuals has been used as resilience towards destabilization during this COVID-19 pandemic. Optimal nutrition and dietary nutrient intake impact the immune system, therefore the only sustainable way to survive in current context is to strengthen the immune system. There is no evidence found that supplement can cure the immune system except Vitamin C, which is one of the best way to improve immune system. A proper diet can ensure that the body is in proper state to defeat the virus. However along with the dietary management guidelines the food safety management and good food practices is compulsory. This article explores the importance of nutrition to boost immunity and gives some professional and authentic dietary guidelines about nutrition and food safety to withstand COVID-19. The novel corona virus affects the lungs and causes flu-like symptoms and pneumonia. Proper nutrition and hydration are vital with a well-balanced diet. A healthy balanced diet is a key for maintaining good health and immunity as highlighted recently by the World Health Organization, a healthy lifestyle makes all bodily functions work better, including immunity. Having a healthy diet, including lots of fruits and vegetables, is a key component of a healthy lifestyle and plays a vital role in supporting a well-functioning and



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Physical Fitness Level Indian Game Kabaddi and Foreign Game Basketball Players

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Research Paper - Physical Education -

ABSTRACT

The motivation behind present investigation is to analyze of physical wellness level between outside game ball and Indian game Kabaddi players. To satisfy the target of the examination, (40 kabaddi and 40 Basketball) players. Just those male players were chosen who have partaken at least bary university level. Just speed, hazardous intensity of arms and dexterity were utilized to gauge the physical wellness parts.

Introduction

Physical wellness is a condition of wellbeing and prosperity and, all the more explicitly, the capacity to perform parts of sports, occupations and day by day exercises. Physical wellness is commonly accomplished through appropriate sustenance, moderate-energetic physical exercise, and adequate rest. Physical wellness is the most significant factor for the advancement in the field of sports and general life. Be that as it may, it is hard to characterize precisely the idea of physical wellness. Basically physical instruction and sports hold it's interesting in the field of training in any nation. Along these lines a nation must need to focus on improvement and advancement of physical instruction and sports. From one perspective games progressively loved in media while then again its being constantly overlooked in the instruction framework. Qualification for any games comprises of number of interrelated characteristics or factors, for example, speed, quality, continuance, adaptability and coordination. Such a large number of players and competitors live at a degree of wellness far underneath their capacities and abilities making drudgery of the games movement in which they take part. They show


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Effects of Weight training on start skill among competitive swimmers

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Research Paper - Physical Education

Introduction

Principle of specificity shows that the development of muscular fitness is specific to the muscles trained. This means that if you were doing weight training for a sport, then weight training will be most beneficial if the exercise resembles the action of the sport.

For a beginner, entering a gym full of hard bodies for the first time can be somewhat daunting. There are so many different muscles to learn about and so many different exercises to accommodate these muscles and also the sophisticated machines there out there. The idea is to get to know your body, get to know your strengths and limitations, and get comfortable with the feel of actually moving the weights correctly. Individuals do weight training for many reasons. Here are some good reasons why weight training should be incorporated into your exercise regimes. Increase strength, Improve appearance, Helps to control your weight, Strengthen bones, Boost your energy, fitness, endurance levels.
Increase strength -

although not all individuals do weight training to win an Olympic medal, doing weight training can help you with many things you do every day. This is advantageous to have for both men and women.

Swimming is a healthy workout that can be done for a lifetime. It is a low-impact activity that has several mental and bodily health benefits. That is a recreational motion for everyone. Swimming could provide you with a low-impact workout and it's also a




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आंतरमहाविद्यालयीन लघुअंतर धावण्याच्या स्पर्धेतील सहभागी महिला खेळाडूंच्या आत्मविश्वासाचा क्रिडा कार्यमानावर होणाऱ्या परिणामांचा अभ्यास

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Research Paper - Physical Education

प्रस्तावना :

क्रीडा स्पर्धांमध्ये मुलींच्या खेळातील सहभाग्याव्यत बहुतांशी पालकांचे मतपरिवर्तन होत आहे. सध्याच्या सामाजिक परिस्थितीशी समायोजन करणे व स्वतःची व्यवसायिक कारकीर्द घडविणे याबाबत मुलींमध्ये खूप स्पर्धा आहे या स्पर्धेच्या युगात मानसिकता, व्यक्तिमत्त्व, आत्मविश्वास व निवास परिसरातील वातावरण याचा परिणाम एकमेकांशी होत असतो. सध्या मध्यमवर्गीय व अल्प उत्पन्न गटातील मुलींना पोलीस, सैन्य भरती व इतर नोकरीसंबंधामध्ये शारीरिक क्षमता घाचणी ही सामान्य ज्ञानासोबत अनिवार्य आहे. म्हणून मोठ्या प्रमाणात स्पर्धा सराव ह्या मुली करत आहेत. तसेच खेळाडूंना नोकरीमध्ये आरक्षण असल्याकारणाने व मैदानी स्पर्धा हा वैयक्तिक प्रकार असल्याकारणाने यामध्ये पक्षापातास संधी नसल्याकारणाने बहुतांशी मुली या क्रीडा प्रकारामध्ये सहभाग नोंदवत आहेत.

या बाबींचा विचार करता संशोधिकेने लघु अंतर धावण्याच्या महिला खेळाडूंच्या क्रीडा कार्यमानावर त्यांच्या व्यक्तिमत्त्व, आत्मविश्वास व निवास परिसराचा होणाऱ्या परिणामांचे अध्ययन करावे असा मानस झाला. तसेच संशोधिका ही स्वतः लघु अंतर धावण्याच्या राष्ट्रीय स्पर्धेत सहभागी खेळाडू आहे व स्वतः या क्रीडा कौशल्याच्या आधारावर पोलीस भरती होऊन पदावर कार्यरत आहे.

शरीरधारणासाठी नियमित व्यायाम करण्याची आवश्यकता असते व नियमित व्यायाम, जिम, योगा, वेगवेगळे प्रशिक्षण घेवून चांगले व्यक्तिमत्त्व तयार करू शकतो त्याच प्रमाणे व्यक्तीचा आत्मविश्वास वाढवण्यासाठी त्याची प्रशंसा करणे, तारीफ करणे, संघनायक बनवणे, प्राप्त केलेले यश/ कामगिरी याची उचित ठिकाणी प्रसिध्दी करणे, क्रिडामार्गदर्शकाचे व्यक्तिमत्त्व व आचरण खेळाडूंना प्रेरणादायक ठरते. त्यामुळे मार्गदर्शकाचे व्यक्तिमत्त्व व आचरण आदर्श असणे महत्त्वाचे आहे.

खेळाडूंचा आत्मविश्वास वाढवण्यासाठी त्यांचा पोशाख, साधने, मैदान, साहित्य



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Effects of Weight training on start skill among competitive swimmers

Dr. Ashwin P. Borikar
Sport Director,
Science College,
Nanded, Dist. Nanded

Research Paper - Physical Education

Introduction

Principle of specificity shows that the development of muscular fitness is specific to the muscles trained. This means that if you were doing weight training for a sport, then weight training will be most beneficial if the exercise resembles the action of the sport.

For a beginner, entering a gym full of hard bodies for the first time can be somewhat daunting. There are so many different muscles to learn about and so many different exercises to accommodate these muscles and also the sophisticated machines there out there. The idea is to get to know your body, get to know your strengths and limitations, and get comfortable with the feel of actually moving the weights correctly. Individuals do weight training for many reasons. Here are some good reasons why weight training should be incorporated into your exercise regimes. Increase strength, Improve appearance, Helps to control your weight, Strengthen bones, Boost your energy, fitness, endurance levels.

Increase strength –

although not all individuals do weight training to win an Olympic medal, doing weight training can help you with many things you do every day. This is advantageous to have for both men and women.


Swimming is a healthy workout that can be done for a lifetime. It is a low-impact activity that has several mental and bodily health benefits. That is a recreational motion for everyone. Swimming could provide you with a low-impact workout and it's also a



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RESEARCH ARTICLE

Microwave-enhanced heterocyclization: A convenient procedure for 1,5-benzothiazepine using 2-ethoxy ethanol solvent and its antibacterial potential

Gajanan Kottapalle¹ | Dayanand Jadhav² | Pravin Poul³ | Avinash Shinde⁴ ¹Department of Chemistry, Digambarrao Bindu ACS College, Bhokar, India²Department of Botany, N.E.S. Science College, Nanded, India³Department of Microbiology, N.E.S. Science College, Nanded, India⁴Department of Chemistry, N.E.S. Science College, Nanded, India**Correspondence**Avinash Shinde, Department of Chemistry, N.E.S. Science College, Nanded (MS)-431602, India.
Email: dras04@gmail.com**Abstract**

The present research study involves synthesis of 1,5-benzothiazepines has been prepared, derived from chalcones and 2-aminothiophenol in a catalytic amount of piperidine using different solvent conditions under microwave irradiation procedure with the aim to test their antibacterial activity and effect of different solvents in the synthesis. It resulted in good yield of 1,5-benzothiazepines (**3a-j**) and proved to be an efficient and environmentally benign procedure. The synthesized compounds were characterized by conventional spectral data and screened for their *in vitro* antibacterial activity against four pathogenic bacteria using agar diffusion method. The traditional classical heating method takes more reaction time. So, in this study, we have tested microwave irradiation process and found that 2-ethoxy ethanol as an alternative solvent in reducing the reaction time (up to 4–6 min.) with high yield as compared with classical method. The synthesized compounds **3a**, **3c**, **3d**, **3e**, **3h**, **3i**, **3j** exhibit good to moderate antibacterial activity.

1 | INTRODUCTION

The 1,5-benzothiazepines are well-known representative of benzologs of 1,4-thiazepine and one of the three possible benzo-condensed derivatives [1–3]. 1,5-Benzothiazepines have been attracted as an important class of heterocyclic compounds in drug research and pharmaceuticals because they possess diverse bioactivities [4–7], and these derivatives are of remarkable interest for lead discovery because they have been found active against various families of targets [8]. 1,5-Benzothiazepines are widely used as anticonvulsant [9, 10], anti-inflammatory [11], antifungal [12], antiarrhythmic [13], antibacterial [14, 15], anti-breast cancer [6], antihypertensive [16], anticancer [17] hypnotic, anti-HIV, as well as antitubercular agents [18]. Moreover, 1,5-benzothiazepines have been combined with other well-known pharmaceutically active compounds such as substituted naphthalene derivatives to form a single molecule with improved pharmaceutical properties [19]. Therefore, their beneficial properties have prompted us to study these compounds.

The most straightforward protocol for the synthesis of 1,5-benzothiazepines involves the reaction of 1,3-diarylprop-2-enones (chalcone) with *o*-aminothiophenol. The various reported methodologies involve the use of inorganic supports at 80°C for 3 h [20], AcOH or TFA in EtOH or toluene under reflux [21], AcOH in DMF or EtOH at 60°C for 5 h followed by keeping at room temperature for overnight [22], and EtOH saturated with HCl under reflux for 3 h [23]. However, many of these reported procedures have one or more disadvantages such as the use of high boiling solvent that is difficult to recover; excess amounts of acid or base and using corrosive materials (e.g., HCl gas, TFA), use of expensive catalyst, low selectivity, harsh reaction conditions, low yield, and relatively long reaction time make these methods environmentally hazardous. In recent years, the substitute of hazardous-solvent with environmentally benign solvents is one of the main areas of green chemistry [24]. The use of alternative reaction solvents such as ionic liquid [25], supercritical media [26], and polyethylene glycol [27, 28] (PEG) is growing rapidly.



RESEARCH ARTICLE

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Developing skilled workforce in academic libraries : The need of the hour

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Shri. S. B. Deshmukh², Librarian, Indira Gandhi College of Arts and Science, CIDCO, Nanded
Email: shivrajdeshmukh@gmail.com

Abstract

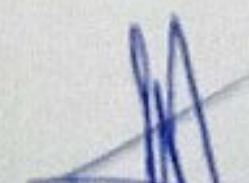
The research paper attempts to highlight the status of ICT awareness among library professionals specially supportive staff of academic libraries. Librarians are assumed responsible authority for library services and overall development of the library but facts shows that success of librarian and library depends on supportive staff and their expertise in discharging services i.e. both traditional and modern. In order to verify the status, a telephonic survey was conducted with librarians for gathering information about library automation processes, dealing with e-Resources etc. Based on the queries, ICT information needed to work in e-environment has been collected and briefly described as under to enable supportive staff to work efficiently. In concluding remark it was recommended that supportive staff needs regular training to work effectively with confidence in ICT environment and in respect of this librarians should take lead for conducting of ICT trainings.

Key words: Library staff, ICT. Computers, electronic devices, Networking, Internet. Web.

Introduction: Today use of ICT has become the important part of our life irrespective of profession and education. Library field is not exception to this. Academic libraries particularly of colleges and universities are expected to remain at front as they serves information needs of faculty and researcher scholars. Print resources and traditional services both are being continuously transforming in electronic form. Almost all academic libraries are recognised with new name hybrid libraries. Presently there is no problem of shortage of information and literature. Libraries have overloaded with huge volume of information. To retrieve only needed and relevant information quickly has become the great challenge for library staff. The reasons may be lack of computer knowledge, no training facility, no financial support for computerisation of library, poor internet facility, no interest of learning new technology....etc. But library needs computer trained and ICT familiar staff to work effectively has become the common issue of discussion among librarians.

Realising this situation it was thought to collect information regarding problems faced by the supportive staff while working in e-environment, process, understand and then provide them necessary information about various electronic devices and other related areas of ICT. Purpose of this paper is to update knowledge of library staff about




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Watershed level Morphometric analysis of Kayadhu River, Sub-Basin of Penganga River, Maharashtra India

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Abstract

The morphometric analysis is carried by tracing and digitizing in the GIS environments in the vicinity of the Kayadhu river. SOI topographical maps of scale 1:50,000 are used to bring out sufficient information. The morphometric analysis of 36 watersheds along Kayadhu river in order to bring out tectonic impression of the area. The Geoprocessing is done firstly with general aspects as linear, areal, shape then its asymmetry factors are analyzed. The Kayadhu river encompasses total geographical area of 1630sq.km. Kayadhu forms its course in the vicinity of Penganga which is sub-basin of Wardha River. Except some parts of the Kayadhu river, the morphometric analysis show region is tectonically slightly unstable.

Keywords: Tectonics, Morphometry, Geoprocessing, Kayadhu river.

Introduction

Nowadays, Geographical Information System (GIS) along with Remote Sensing (RS) are very popular in analyzing and understanding the selected area. The GIS is defined by Department of the Environment¹ as, "A system for capturing, storing, checking, manipulating, analyzing, and displaying data which are spatially referenced to the earth". Most researchers stated the geomorphic indices of active tectonics are powerful tool to assess the connection amongst the tectonics and basin morphology on specified scale to analyze existing geological deformations which is reflected in their watershed. Recently many researchers have used remote sensing data and GIS generated more precise data on morphometric parameters and analysis²⁻⁶.

The fluvial landscape is mostly dominated by the river which are sensitive to deformations if occurs. The deformations in ancient and recent times controls the surficial expression in the form of drainages. All these drainages records and changes with the deformations occurred till in recent time. The current river is sub basin of the Penganga river which may be partially active due to nearby Kaddam Fault. This makes the study area sensitive for tectonics. The detail analysis is carried with various aspects in the morphometric analysis, which encompasses drainage density (Dd), stream frequency (Sf), elongation ratio (Re), asymmetry factor (AF) and bifurcation ratio (Rb).

Study area: The extent of the kayadhu river sub-basin is traced from catchment to mouth in the SOI 1:50,000 scale toposheet as, 56A9, 56A13, 56A14, 56E1, 56E2, 56E6, 56E7, 56E10, 56E11. The location and drainage map of the study area is given in Figure-1.

The Kayadhu river flows from Hingoli district to Nanded district with total area of 1630sq.km. the area is entirely covered by Deccan Volcanic Basalt (DVB) of late Cretaceous to early Eocene age. The black cotton soil is the product of the Deccan basalt which is good for agricultural use. On an average the rainfall of the area is 890.28mm. The dendritic drainage pattern is very well developed in the study region which further indicates uniform lithological condition.

Methodology

The present study uses SOI toposheets used for building base maps. The SOI top sheets of scale 1:50000 is used for morphometric analysis. The stream ordering is used in the study region for the sake of its simplicity in the numbering of the stream networks⁷.

The drainages which are considered here, have two different methodology, one the longest stretch of the Kayadhu river is traced and then the 36 watershed inside the Kayadhu Sub-Basin are digitized (Figure-2). Second the entire Kayadhu basin is considered as one Sub-Basin, in this the drainages found to be the highest 7th order (Figure-1). The numbering of the basins have been given in alphabetical manner of the concerned watersheds for the sake of the simplicity while calculations. Most basin names are directed by SOI and whereas names of remaining watersheds are captured by nearby villages. The morphometric parameters determined are bifurcation ratio, elongation ratio, drainage density, stream frequency, and asymmetry factor. Bifurcation ratio is the ratio of streams of first order (1o) to the second order (2o) and so on. Drainage density is derived from dividing the total length of streams by the total area of the basin.





ANALYSIS OF TILTING SIGNATURES OF THE KORADI NADI FOUND IN THE VICINITY OF THE PENGANGA RIVER BASIN.

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³Department Geology, Dnyanopasak College, Parbhani 431401, Maharashtra

Corresponding Author - **Sumeet Chavhan**

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Abstract

The morphometric analysis of Koradi Nadi is carried out by tracing and digitizing the toposheet maps of Survey of India. The Koradi Nadi is a part of the Penganga River basin. The Penganga river is partially active with influence of nearby Kinwat and Kaddam faults. The study area has major three meso-watersheds and all of them falls right side with total area 281 Sq. km. of the present Koradi river and a macro-watershed with total area of 352.4 sq. km. The first hand geoprocessing bring out the linear, area, shape aspects and with this further analysis suggest the tilt when applied the geomorphic indices of active tectonics (GIAT).

Keywords: Tectonics, Geomorphic indices, Morphometry, Geoprocessing, Koradi Nadi

Introduction

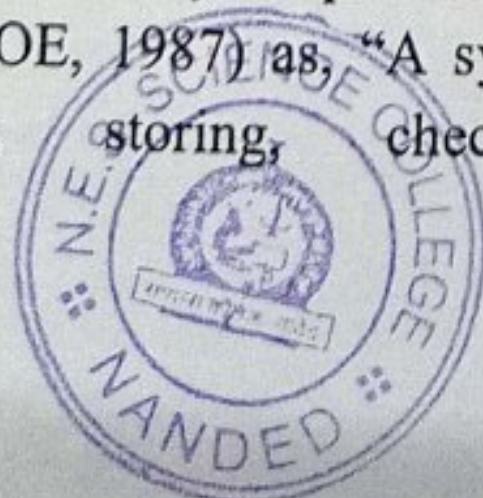
The landscape evolves through series of modification of tectonically produced slopes by erosion, deposition, and the continued growth of structures, then drainage system adapts the changes in surface slopes. Drainages thus have potential to record entire history of evolution of folds, faults and its associated tectonically active structures. In the region of active tectonics, the landscape itself can lead to the existence of active structures mainly because of topography that has been resulted by its associated rates of erosion and deposition.


In recent days, Geographical Information System (GIS) along with Remote Sensing (RS) became very popular in analyzing and understanding the basin areas. The term GIS is defined by Department of Environment (DOE, 1987) as, "A system for capturing, storing, checking,

manipulating, analyzing, and displaying data which are spatially referenced to the earth". To analyze recent geological deformation under most of watersheds, researchers nowadays considering the geomorphic indices for active tectonics as a powerful tool to evaluate the relationship between tectonics and development of basin under specified scale.

Generally, most of the landforms are dominated by the fluvial concentration which are sensitive to any activities if occurs. These activities are considered under deformations in ancient and recent times which are reflected in surficial expression in the form of drainage. All these drainage records the changes of deformations in recent times.

This study falls under the vicinity of Penganga river basin, which may be partially active due to nearby Kaddam fault (Sumeet 2021). This can be attributed




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CLUSTERING ALGORITHMS AND THEIR APPLICATIONS IN CLOUD COMPUTING ENVIRONMENT

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Abstract— Cloud computing is Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. Cloud computing is the hottest purpose built architecture created to support computer users. The cloud addresses three main areas of operation SaaS (software-as-a-service), PaaS (platform-as-a-service) and IaaS (infrastructure as a service). The large amount of data can be stored into cloud Data centers with low cost. We Integrate Data Mining and Cloud Computing to provide a quick access to this large volume amount of data on cloud. This paper aimed to study Clustering algorithm which can be applicable in cloud computing. This paper also describes the role of soft clustering in Cloud computing environment.

Keywords— Cloud Computing, Clustering, Soft Computing, Hard Computing, K-means, FCM

I. INTRODUCTION

Cloud computing is the delivery of computing services—servers, storage, databases, networking, software, analytics and more—over the Internet (“the cloud”). Cloud has three major components.

- i) Client Computers
- ii) Distributed Servers
- iii) Data Centers

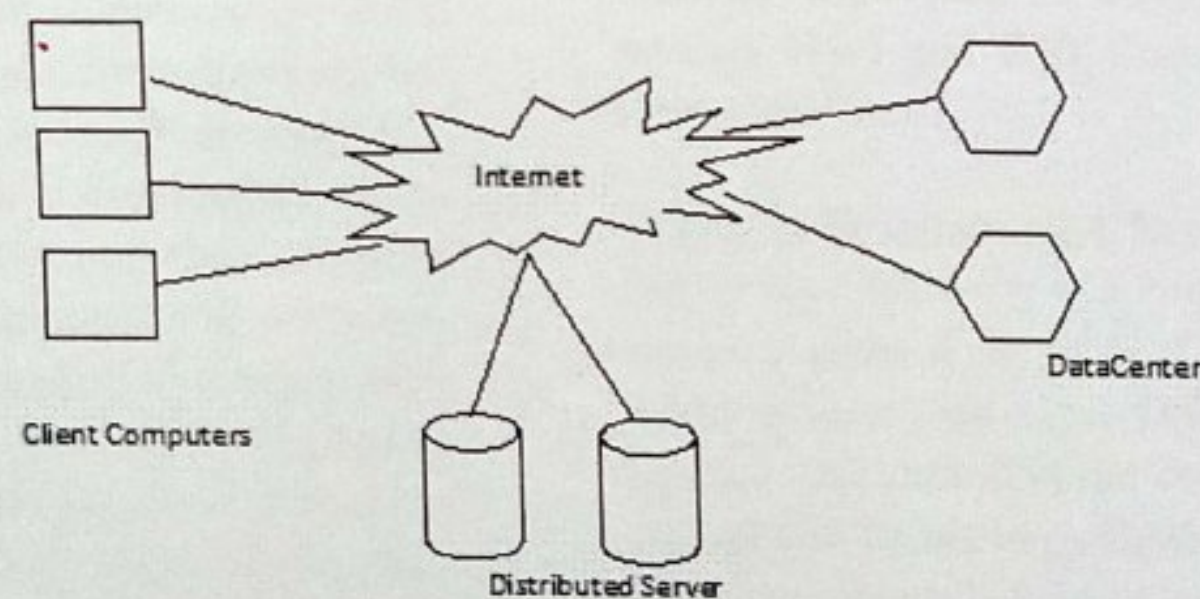


Fig -1 Cloud Components

Clients are the device that the end user interacts with cloud. Distributed servers are in geographically different places, but servers act as if they are working next to each other. Data center is a collection of servers where application is placed and is accessed via internet.

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A Literature Review on Text Document Clustering Algorithms used in Text Mining

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Dr. P.G. Khot, Department of Statistics RSTM University, India

Abstract

An Exhaustive growth of Knowledge in the form of textual documents in almost every area of digital era needs an extensive demand for new powerful tools to filter the text documents and extract required knowledge from it. A research technology known as 'Text mining' helps to discover required knowledge from a collection of text documents and design a system to provide this knowledge to support the user's decision. The text miner program gathers the relevant documents (Textual data) together, mines the information and converts this unstructured data into structured database. Document Clustering plays an important role in Text Mining. A clustering is defined as a grouping of documents including features, which are more similar to each other than to the features of any other group. In other words, documents from one cluster share some common features, which distinguish them from the other documents. This paper gives a literature survey on different document clustering techniques. The paper briefly studies hard clustering techniques and tries to explore soft computing techniques in detail.

Keywords: Hard Computing, Soft Computing, FCM, PCM, FPCM

Introduction

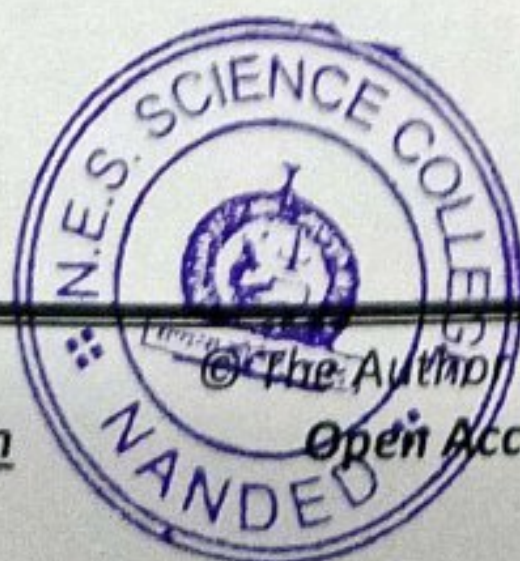
Objects that shares common characteristics like color, size, shape etc, can be grouped into one category. For example different fruits kept into a basket can be easily grouped. Human beings are skilled to divide objects into groups and assign a particular object to a particular group. Forming the groups and dividing the objects into these groups is very common process for human beings. In today's era of digitization, information available in textual form is becoming digital and is available in the textual form on web. While searching information on Internet, we simply search by using any search engine. The role of the search engine is to match queried information into each textual document and display most relevant of them. If these scattered documents are grouped together according to their contents, then searching becomes very easy task. It will also reduce Searching time. Document Clustering is a process of dividing text documents into groups or clusters such that the documents containing information on similar topic will present in the similar group. Different clustering algorithms were devised which are applied for Document Clustering. These Clustering algorithms are broadly divided into two categories, Hard Clustering and Soft Clustering. In Hard Clustering algorithms a single element belongs to exact-

ly one cluster while in soft clustering overlapping is permitted i.e. a single element may present in multiple clusters. In document clustering one document contains information related to more than one topic. Hence in Soft Clustering such documents may present in multiple clusters. Document Clustering research shows that many machine learning algorithms are applied for soft document clustering. In soft Computing, Fuzzy C-means algorithm is most popular algorithm.

Possibilistic c-means algorithm is a variation of FCM algorithm while FPCM ie. Fuzzy Possibilistic c-means algorithm is an Hybridization of possibilistic c-means (PCM) and fuzzy c-means (FCM). This paper studies different steps used in Document Clustering and then reviews Hard and Soft Computational techniques and their Algorithms.

What is Document Clustering?

Document Clustering is a branch of data mining where we have given a set of S of N textual documents. We partition them into a pre-defined number of K subsets S_1, S_2, \dots, S_k such that the documents belonging to subset suppose S_k are most similar to each other as compare to the documents belonging to various Clusters^[5]



An Experimental Study of Recall and Precision Rates in Retrieval of Text Documents Using Different Distance Measures

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Abstract—Searching is the most important process in an information retrieval from available large databases. Many times we search for a set of documents which is relevant to the given search document. Text mining helps us to mine the information from a given set of documents and it is most popular technique in Information retrieval. In this research paper we have applied distinct distance measures for retrieval of most similar documents to the queried document from a set of given document. For obtaining optimality for required search, we have gone through pre-processing of documents, creating vector space model and used distance measure techniques. Precision and recall are the basic measures used in evaluating search strategies. We have presented five distance measure technique applied on hundred text documents from standard database 20NewsGroup and calculated Recall and precision rate for text documents retrieval. We have used MatLab 10a as a development tool for our experiment.

Keywords— Text Mining, Information retrieval, distance measure, recall rate, precision rate, document.

I. INTRODUCTION

An explosive growth of Knowledge in the form of textual documents in almost every area of digital era needs an extensive demand for new powerful tools to filter the text documents and extract required knowledge from it. After finishing a search the nagging question in every searcher's mind is: "Have I found the most relevant material or am I missing important items?". Text mining is a research technology to discover useful knowledge from enormous collection of text documents and develop a system to provide this knowledge to support the user's decision. The text miner program gathers the relevant textual documents together, mines the information and converts this unstructured data into structured database. Text mining is similar to data mining, except that data mining tools are designed to handle structured data from databases, but text mining can also work with unstructured or semi-structured data sets such as emails, text documents and HTML files etc. As a result, text mining is a best solution for discovering knowledge [1].

The Text mining task will become easier if the documents containing information on similar topic are grouped together into a single class.

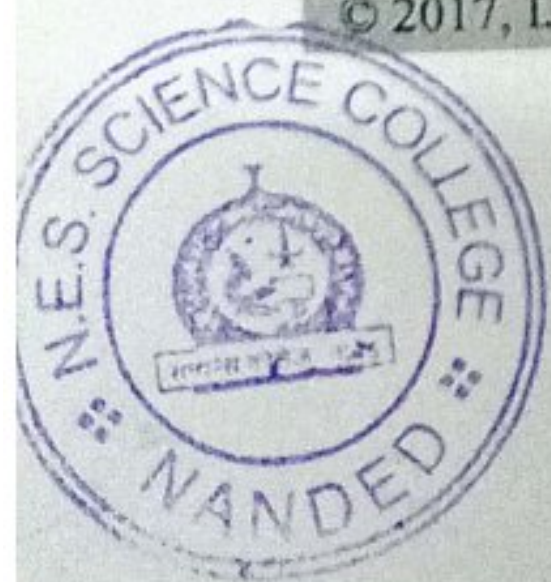
Automatically organizing text documents into meaningful clusters or groups is called Document Clustering [2]. For this grouping, we need to measure the similarity among these

documents. The similarity between two objects might be calculated by comparing its attributes. For ex. Objects with green color can be grouped into a single class. Here we have considered color as an attribute. Documents can be grouped together by retrieving and matching their contents or key words which we further refer as features.

In our experiment, we have attempted to retrieve most similar documents to the query document. In this research paper we have presented our experimental result using six different distance measures and applied Recall and Precision technique for calculating accuracy. To represent the research work, we have split it in six sections. The first section is an introduction. The second section explains the pre-processing steps for extracting features of document. The third section includes the details of recall and precision ratio for document retrieval. The algorithm for vector space model and distance measures is discussed in the fourth section. The results obtained in the experiment are discussed in fifth section. Finally the sixth section summarize conclusion.

II. PRE-PROCESSING

Form the standard database 20newsgroup, we have used 100 documents. 20Newsgroup contains total 17 distinct folders which contain numbers of sample text documents, out of which we have used 100 documents, 50 from folder windows group and remaining 50 from folder religious. We have



Fuzzy Document Clustering based on Frequent Features and Feature Length

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ABSTRACT

Document Clustering is a method of grouping similar documents into one cluster. Fuzzy document clustering is a soft computing technique used for clustering the similar documents. It permits overlapping i.e. it permits single document to belong to multiple clusters. Feature selection and feature extraction is the most important phase during clustering process. In the Literature different feature reduction methods are proposed. In this research paper we have proposed a feature reduction method based on feature frequency and feature length. In this method, we have chosen the features based on no. of occurrence in a set of N documents. We have also taken into account feature length. Finally we have applied fuzzy C-Means clustering algorithm for clustering the N documents into K-Clusters.

Keywords: Document Clustering, Soft Computing, Features selection, features reduction, Fuzzy C-Means.

I. INTRODUCTION

Today information is rapidly growing on Internet. This information is available in the form of Text, Images, Graphs, Charts, and Tables etc. To search the exact information has becoming a challenging task. If the documents containing textual information are well grouped according to their contents, searching becomes easier task.

In the Literature, different methods for document clustering are proposed. The purpose of each method is to group the documents into clusters based on their contents. These methods includes Hierarchical clustering, partitional clustering like K-Means, C-Means, Soft Clustering like Fuzzy C-Means etc.

What is Document Clustering?

[1] We have given a set of N documents. Our objective is to extract the contents of each documents, find the

most important words which we refer it as features and group these documents into K-clusters such that:

- i) Intra-cluster distance is minimum
- ii) Inter-cluster distance is maximum

The Paper organized as follows. In the introduction part we have introduced the research topic, we have the described the steps for document clustering. It is followed by Feature selection methodology we have proposed. We have finally presented some experimental results with a conclusion.

II. STEPS IS DOCUMENT CLUSTERING

[2]The Different steps involved in document clustering are as shown in the figure bellow. It consists of five important steps viz. pre-processing, feature extraction, feature selection, clustering method and analysis of results.


PRINCIPAL

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A Study Of Role Of FOG Computing In IoTs

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Abstract— IOTs in an emerging branch of Information technology that includes transfer of data over a network through the different objects without requiring human to human or human to computer interaction. It was evolved from the concept of Machine to machine communication which is commonly known as M2M. This M2M communication uses clouds for transferring data. But due to the rapid data transfer in the cloud for IOT devices, the density of cloud will be increased that leads to increase in bandwidth and decrease in the processing speed. This problem was solved by a new concept known as “fog computing” or “fogging”. Fog computing acts as a intermediate layer between the cloud and the hardware. This paper studies the role of Fog computing in IOTs.

Keywords— IOTs, M2M, fog computing, cloud, fogging.

I. INTRODUCTION

Internet of Things is a concept based on the capability of various devices connected in the network to sense and collect the data from the surroundings and distribute them across the internet. This data might be further utilized for further purposes as per the user’s interest. The basic concept of IoTs is to generate and share the information among machine to machine through

cloud computing without intervention of human beings. [2] The main intention of IoTs was to minimize the human interaction for data collection and data entry. It was achieved by using different types of sensors in the machines that has capability to collect the data from surrounding environment and transmit it over the network. Hence this is also referred as M2M communication. The basic idea of IoT is shown in the figure bellow.

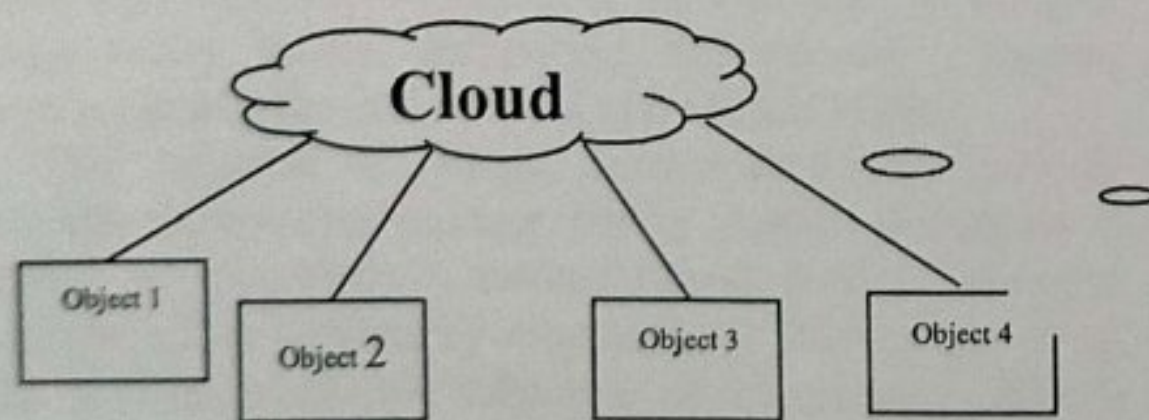


Fig1. Internet of Things(IoTs)

When IoTs and Cloud computing is combined together, it is also known as Cloud of things.

It is very clear that the IoT applications generate massive amounts of data from sensors and other devices. There for to distribution this huge amount of data over a cloud causes many problems such as bandwidth speed of computation etc. Hence there was a need intermediately

computations of the data generated by different devices in IoTs, pre-process it and then distribute it over a network. Here comes the role of Fog computing.

Fog computing which is also referred as “fogging”, is a distributed infrastructure in which different preprocessing and computation are performed at the edge of the network by smart devices. These devices have capability of data processing, data analysis, data storage capability before distributing the data over a cloud. Thus the purpose of fog computing in the IoT is to improve efficiency, performance and decrease the amount of data transferred to the cloud for processing, analysis and storage. The fig bellow shows an idea of fog computing.

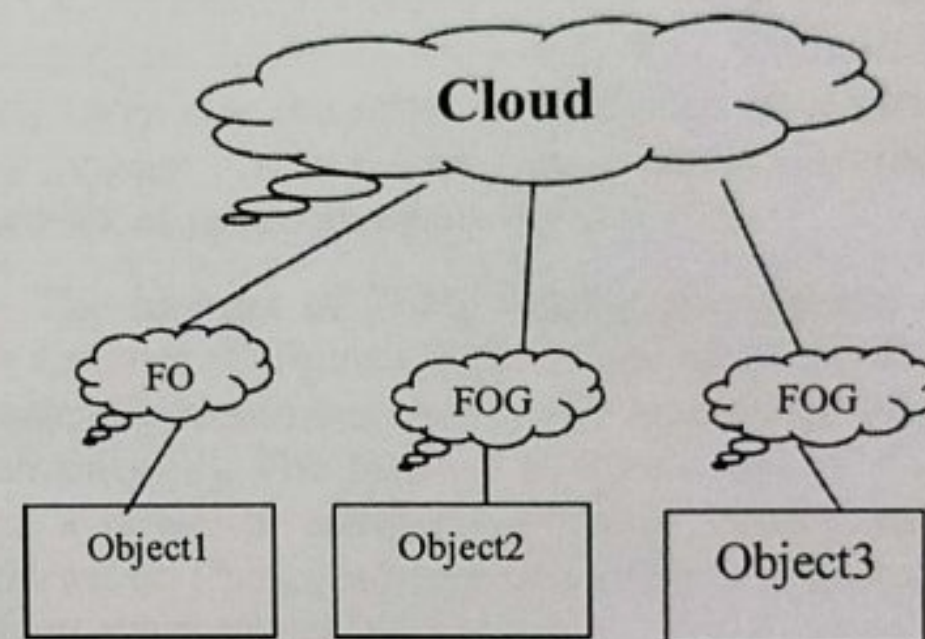


Fig.2 Fog Computing

II. IoTs AND FOG COMPUTING

[3] The general architecture of IoT system consists of five different layers. These layers are

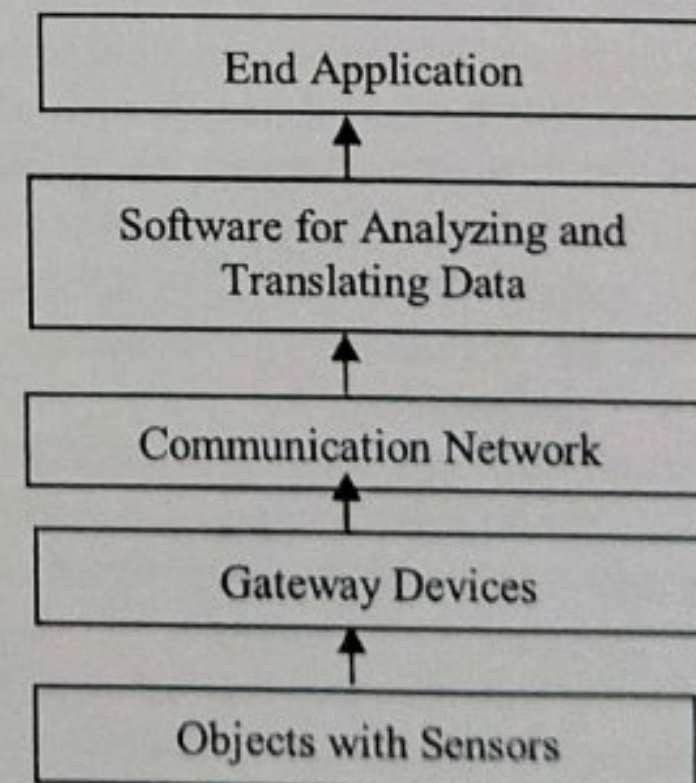
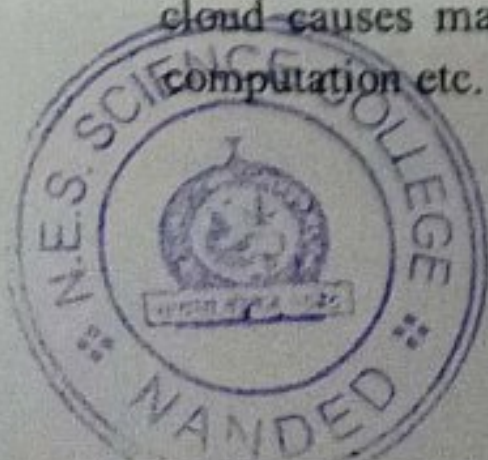


Fig3. Layered Architecture of IoT

i) **Sensors or controllers:** Sensors or controllers are the intelligent devices that are built-in the different objects that are connected to IoTs. These objects are termed as “Things”. Sensors are the devices that



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Internet of Things and its Applications

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Abstract— The high entrance rate of new innovations in every one of the exercise of regular day to day existence is encouraging the conviction that for any new societal challenge there is always an ICT solution that can deal with it successfully. The solution most recently proposed is the "Internet of Things" (IoT). This apparent panacea of the ICT world takes on different aspects and is actually identified with different technological solutions (often very different). As a result, many people believe that IoT is only RFIDs, others believe that it is sensor networks, and others believe that it is machine-to-machine. Meanwhile, industrial players take advantage of IoT's popularity to use it as a very trendy brand for consumer-oriented technology solutions. Sometimes scientific literature doesn't help much to clarify, as it is rich in IoT definitions that are often discordant.

Objective of this paper is to clarify the concept of Internet of Things and it uses in society. Also we are present the applications of Internet of Things, these applications are arranged on ranking and in this ranking 3 main things are considered : people find on Google, people talk on twitter and what people write about on LinkedIn.

Keywords— IoT (Internet of Things), Web of Things, microelectronics, smart home, RFID (Radio Frequency Identification), Intelligent.

I. INTRODUCTION

The Internet of Things is a vision in which the Internet expands into the real world. Everyday objects embrace the world. Physical components are no longer separated from However, the virtual world can be remotely controlled and act as physical access points to services of the Internet. An Internet of Things really makes computing omnipresent. Concept initially presented in the early 1990s[1] by Mark Weiser

The "Internet of Things" terminology was used in 1999 by UK innovation pioneer Kevin Ashton to depict a framework. At that time, questions raised, how to physical world connected to internet by sensors [2]? Ashton makes up the term to exemplify the influence of connecting (RFID) Radio-Frequency Identification tags [3]. This tags used in commercial supply chains to the Internet. So as to tally and track products without the requirement for human mediation. Now days, the Internet of Things has come to be popular term for depicting situations in which Internet network and computing ability extend to a lot of different of things or devices, objects, sensors and regular items.

The vision of the Internet of Things is based on the belief that steady progress is being made. We have seen microelectronics, communication and information technology Over recent years, the foreseeable future will continue. In fact - due to their decrease Size, price decrease constantly and energy consumption decrease-processors, Module communications and


other electronic components are increasingly combined into regular things nowadays.

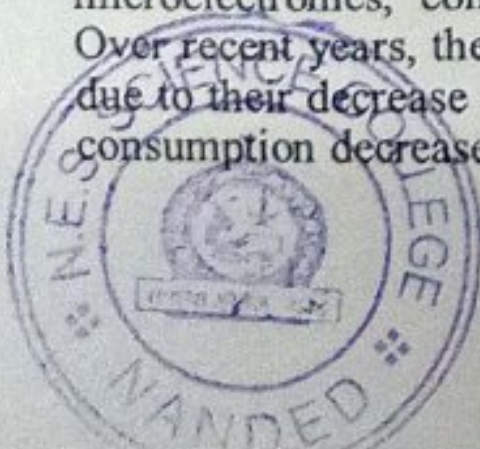
The term "internet of things" has spread rapidly in recent years—it could spread in 2005. You can already find it in book titles [4, 5] and the first scientific conference was held in 2008, held in this area of research [6]. Initially, European politicians only used the term in RFID technology context, but the RFID Conference titles "From RFID to The Internet Things (2006) and "RFID: Towards the Internet of Things" (2007) held by the EU Commission already allude to a broader interpretation. Finally, in 2009, a dedicated EU Commission action plan ultimately saw the Internet of Things as a general evolution of the Internet "from a network of interconnected computers to a network of interconnected objects" [7].

The Internet of Things (IoT), also known as or referred as the Internet of Objects, will change all of us. The Internet affects science, government, enterprise, education, communication and humanity [8]. The Internet is clearly one of the most important and a powerful creation in human history and now, with the Internet of Things concept, the Internet is growing and has smart life in every aspect [9].

II. CONCEPT

The Internet of Things is a new Internet access technology. Objects recognize themselves and obtain intelligence through the Internet of Things by taking or enabling related decisions to communicate information about them [10]. These objects can access information that has been added to other services or can be added to them [10]. Figure 1 review that anything can communicate with the Internet at any time from any place to provide any services to anyone via any network. This concept will create new types of applications such as smart vehicles and smart homes for the provision of numerous services such as automation, communication, entertainment, notifications, security, computers and energy saving [11, 12]. From a technical point of view, the Internet of Things is not the result of a single novel technology; instead, several technical developments combined provide the capabilities to bridge the gap between the virtual and physical worlds. These features include: Communication and cooperation, Addressability, Identification, Sensing, Actuation, Embedded information processing, Localization, User interfaces [13].


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A Study of Hard and Soft Document Clustering Techniques

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ABSTRACT

Now a days web or Internet is a major source of textual information. User submits his query to the search engine and search engine after processing this query provide the necessary information to the user. The task of finding such textual information in voluminous amount of text on web is very difficult task. Researches have developed different algorithms that provide exact information to the user within a less time. It has been observed that when the data is present in groups or classes or clusters, the searching task becomes easier. Just like a person willing to find information regarding Politics may visit to the class where different documents related to the politics are grouped together.

This Paper Studies Hard and Soft Computational techniques used in text document clustering. In Hard Clustering, the text documents are assigned to exactly one cluster giving a set of disjoint cluster. On other hand, Soft Clustering overlaps the groups. It means that a single document may appear in different clusters. Commonly used Hard Clustering algorithms are K-Means, Hierarchical Clustering and Partitioned Clustering etc. Soft Clustering algorithms are Fuzzy C-Means, Clustering using ANN etc.

Keywords

Clustering, K-Means, Fuzzy C-Means, Feature extraction, Bag of Words.

1. INTRODUCTION

Today data and information plays an important role in our day to day life and is essentially needed in almost all areas. The main source for getting such vital information which is easily accessible is Internet. Even though technology assures to get required information quick and accurate, but it is inefficient against the demand. To fulfill the requirement different data mining techniques and methods are available. With the help of data mining integrated with clustering will increase the speed and accuracy of extracting the required information from voluminous amount of text data which is distributed

across the world. This paper studies the Hard and Soft Computational Techniques used in Document Clustering.

2. What is Document Clustering?

Document Clustering is a branch of data mining where we have given a set of S of N textual documents. We Would like to partition them into a predefined number of K subsets S_1, S_2, \dots, S_k such that the documents belonging to subset suppose S_k are most similar to each other as compare to the documents belonging to different Clusters [5]

Document clustering is a technique aimed towards grouping similar documents into a cluster [11]

2.1 Difference between Hard Clustering and Soft Clustering

In Hard Clustering, each document can belongs to only one Cluster. Hard Clustering is also known as exclusive clustering. In Soft Clustering Same document can belong to more than one group. It is also known as Overlapping Cluster technique. The figure bellow differentiates these two techniques.

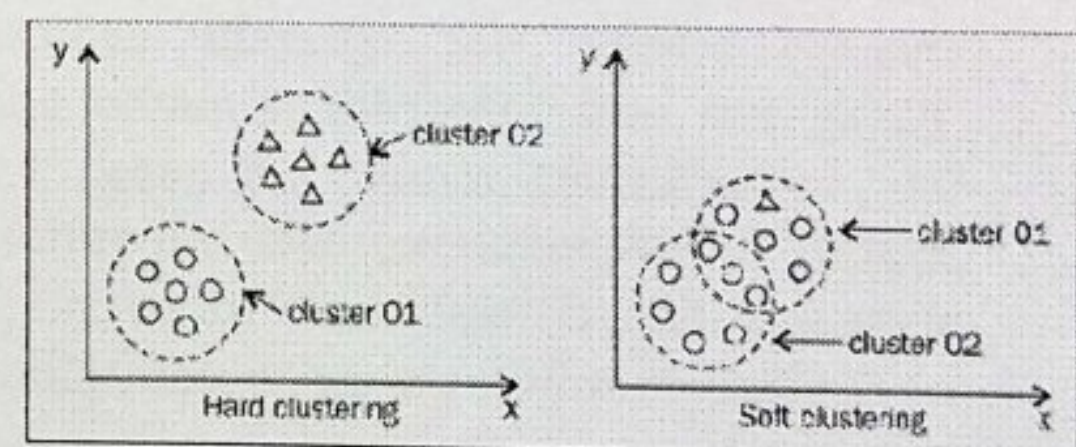



Fig 1. Hard Clustering and Soft Clustering. [12]

2.2 Document Clustering Process

Document Clustering Process involves following steps [4]

- i) **Pre-processing of text:** This step involves cleaning up the text by removing non textual




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Applications Of Clustering Techniques In The Different Research Areas Of Applied Sciences

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Abstract:

In today's high speed and digital human life, Internet plays a imperative role. Peoples working in different research areas of applied sciences are searching their required information on the Internet. Due to advancements in web technologies, amount of data available has grown tremendously. Information retrieval from this voluminous data has become most difficult but very needy operation. Data mining is the computing process of discovering patterns in large data sets involving different methods with the integration of machine learning, statistics, and database systems. Clustering is often referred as the first steps in data mining. It identifies groups of related records that can be used as a starting point for exploring further relationships. Clustering techniques are used in different research areas of applied sciences. This paper attempts to focus application of clustering techniques in different areas of applied sciences. In the first part of the paper we have introduced clustering and clustering techniques. Later we have presented applications of clustering in different areas of applied sciences.

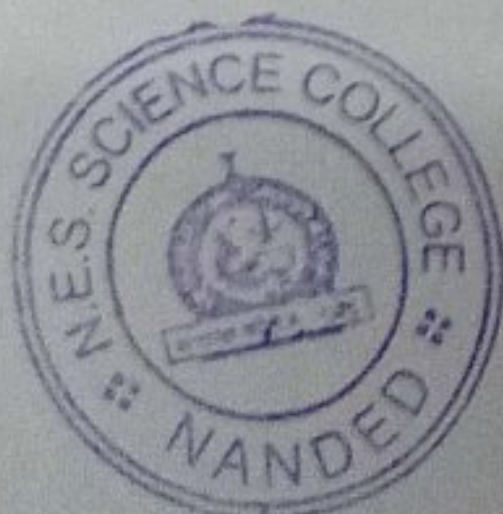
Keywords: information retrieval ,data mining ,clustering ,Text Mining ,BioMedical Text ,Image Segmentation ,GIS


1. Introduction

Searching is a major part in the knowledge discovery. Searching becomes easier if objects to be search are classified. From childhood, we have learned to classify objects by color, size and shapes. Human beings are skilled to divide objects into groups and assign a particular object to a particular group. Clustering or cluster analysis is a process of grouping the objects having similar attributes. Main objective of clustering is to minimize intra-cluster distance and to maximize inter-cluster distance. In knowledge discovery, search plays very important role. Grouping of objects having similar attributes will increase efficiency of searching process. In different areas of applied sciences clustering plays very significant role. For example, in

chemical sciences, Periodic Table is the result of a clustering of the elements in groups that presented similar physical properties. We can easily locate any element within a periodic table. In life science also researches classify the similar species having common attributes into one group. Many times the words classification and clustering are used interchangeably. Though the purpose of classification and clustering is similar, these two are different methods.

In classification you have a set of predefined classes and want to know which class a new object belongs to. Clustering tries to group a set of objects and find whether there is some relationship between the objects. In the context of machine learning, classification is supervised




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Handwritten Devnagri Numeral Recognition using Chain Code Technique

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Abstract: Identifying an object by using its shape is a simple task for human beings. But it is very difficult to implement such capability within a machine. Researchers tried to recognize the different shapes and object by designing different techniques and algorithms. Deep learning and neural network based algorithms were mostly focused by the researchers. In this research paper we have developed a system for handwritten devnagri numerals recognition using chain code technique. We have collected samples of handwritten numerals from different peoples from different regions and age groups. A proposed algorithm successfully identifies a numeral from these samples.

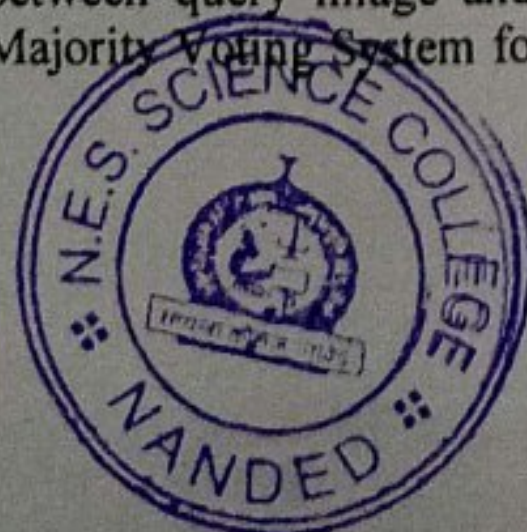
Keywords : deep learning, neural network, chain code.

I. INTRODUCTION

Human beings are born intelligent. They can identify an object very easily by past experience. For examples we can easily identify a mango from a group of different fruits. Generally we identify the object with its shape, color and other features. To develop this potential within a machine is a very challenging task. Researchers tried to impart this ability within a machine by developing different machine learning algorithms. Character recognition is another important challenge to the researchers. Human beings have different style, shape and curvature while writing the devnagri characters. The handwriting changes as the person grows. Therefore the characters written by four years kid will be differs from same that is written by 30 years matured person. Hence this is challenging task to machine to recognize these characters.

In this paper we have proposed an algorithm to recognize the hand written characters in devnagri. We have applied chain code technique to identify the hand written character.

We have also used fuzzy c means distance technique for compute the distance between query image and database images. We have used Majority Voting System for decision combinations.



II. Methodology

In this research work we have used three different methods in our algorithms for identifying the object viz. Chain coding, Fuzzy c means distance technique and Majority voting System.

a. Chain Coding Technique: ^{1]} Feature extraction plays a vital role for any Image processing application. Most common properties of any image are shape, texture and color. All these properties are very important for image identification and classification. Shape description plays imperative role in image classification. Most commonly there are two methods for shape description namely contour base and region based. Contour shape techniques only exploit shape boundary information. In region based techniques, all the pixels within a shape region are taken into account to obtain the shape representation, rather than only use boundary information as in contour base methods.

In this paper, contour based, the chain code description method was experimented for different hand written character recognition. Chain code means consecutive or successive two object points that may be in four directions as shown in figure I. In this way we get 4 features of a numeral and each numeral divided into four quadrants for its spatial relationship. Hence $4(\text{chain code}) \times 4(\text{quadrants}) = 16$ chain code features we used for this experiment.

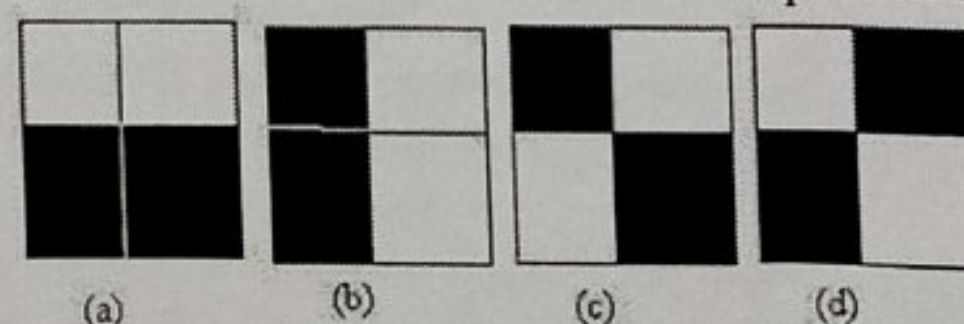


Figure I: Images of four chain code

b. Fuzzy c means distance technique:

^{2]} This algorithm works by assigning membership value between 0 to 1 to each data point corresponding to each cluster center. It is based on the distance between the cluster center and the data point. If the membership value is more, it means that the item is nearer to the cluster.

c. Majority voting System: ^{3]}

Majority voting systems for decision combination, choices between selecting either the "consensus decision" or the "decision delivered by the most competent expert" strategy. We have used Max Voting.

Max Voting: If there are n independent experts having the same probability of being correct and each of these experts produce a unique decision regarding the identity of the unknown sample, then the sample is assigned to the class for which all n experts agrees. Assuming that each expert makes

ROLE OF GREEN CLOUD COMPUTING FOR SUSTAINABLE FUTURE

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Abstract: In today's era of science and technology, cloud computing plays very significant role in almost every applications due to its reliability, scalability and performance. An increasing demand of cloud data insist establishment of new datacenters. It results into high electricity consumption, increase in carbon footprints and e-wastage. It is a real challenge for environmental protection and sustainable future. Therefore it is a need for energy efficient technology to minimize the negative impact of cloud computing on environment. It leads into usage of green cloud computing for sustainable future. In this paper we present different issues related to cloud computing that affects on sustainability of environment. We also discuss the green cloud computing that minimizes the environmental debacle and leads towards sustainable future.

Keywords: Clod Computing, Sustainable future, carbon footprint, e-wastage, green cloud computing.

I. Introduction

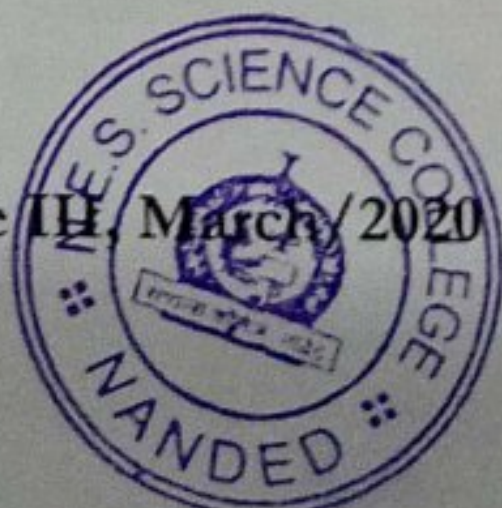
Since the beginning of twenty first century, the speed of Internet and supporting equipments in rapidly growing from Kbps to Gbps. There for millions of queries are submitted to get the information and knowledge. It leads into a huge demand of data from datacenters. Cloud computing is Delivery of computing services such as servers, database, storage, software and networking over the internet. It leads to requirement of huge infrastructure to facilitate the users of cloud. Cloud computing requires huge data centers, fast computing software and high speed internet. Increasing usages of social apps such as online banking, trading and media great demand to cloud data. An increasing infrastructure of cloud computing makes negative impact on the environment. In cloud computing, the excessive power cycling of servers could negatively impact their reliability. It also results into carbon footprints and e-wastage. In this paper we have made a detailed study of Environmental sustainability issues due to cloud computing infrastructure. Further we explore the involvement of green computing for sustainable future.

II. What is Cloud Computing?

Cloud Computing is a very commonly used term which in general means that to deliver the hosted services the Internet. Cloud computing provides three types of basic services namely infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS)

IaaS includes physical machines, Virtual machines, storage, PCs and workstations. PaaS is a layer of Cloud computing that provides Software platform to run the system. On topmost layer of Cloud computing Architecture, the Cloud services that are referred as Software as a Service (SaaS) which is a software delivery model providing on-demand access to applications.

The Fig bellow shows three level architecture of cloud computing that highlights services provided at each level.



APPLICATION OF DATA MINING TECHNIQUE ON SPATIAL DATA FOR SITE SELECTION

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Abstract: if we consider that this is the peak period of Economic and population growth, urbanization, globalization and industrialization in the world and we think human life is progressing at its high level. On the other side there is a black side to this progress. As the human life is developing, simultaneously there is growth in population also, as the population increases the generation of waste is also increasing as every person generates near about 0.725 kg solid waste daily. The increase in generation of waste is a live and big problem for every urban and developing city. The main in front of decision makers of urban and developing city is of solid waste management. If we look at the digits of waste generation throughout the world for a day it is very dangerous for human life and environment. As a waste management decision makers of municipality can use the suitable site for dumping of solid waste. Decision makers of municipality have to face many problems to select a suitable dumping site for solid waste as the decision making process involve large data and its analysis. To overcome the problem of decision makers the latest technology GIS integrated with soft computing technology is very adaptable to every municipality. The combination of GIS and fuzzy logic, MCDA, AHP can also be utilized.

Keywords: Solid waste, Dumping site, Landfill site, GIS, Fuzzy approach, MCDA, decision making, Suitable site, FMCDM.

I Introduction:

Identification of environmentally acceptable and financially affordable landfill or dumping site for solid waste is the biggest challenge to decision makers of municipality as it involves number of criteria and vast spatial and non spatial data interpretation [1]. While deciding suitable site the decision makers have to follow the phenomena "Not in My Backyard" (NIMBY) and "Not in

Anyone's. While selecting most suitable site for solid waste, decision makers have to make sure that the selected site must fulfill all the criteria suggested by World Health Organization and it will not affect the health of society and environment. Every municipality must have a suitable site for the dumping of solid waste as a solid waste management, and if the solid waste is not treated properly and managed, it will be the cause of diseases transmission, fire hazards, odor nuisance, atmospheric and water pollution, aesthetic nuisance and economic losses [2]. For such cases decision making with soft computing technique of fuzzy and GIS can be combining together and applied to solve the problem and suggest the optimum sites and same is presented in this paper. GIS is capable to hold and critically analyze, retrieve, represent the vast amount of spatial and non-spatial data.

II Selection Process of Suitable dumping site for solid waste:

Any selection method of dumping site for any municipality have some common process. The dumping site selection process may involve number of criterion and steps like

1. The cost of dumping site must affordable to the municipality
2. The land selected for dumping site must be non-agricultural
3. The dumping site must not be so close to following areas of the city
 1. Landuse and landcover
 2. Water bodies
 3. Rivers
 4. Underground water
 5. Schools
 6. Hospitals
 7. Markets
 8. Airports
 9. National, state highways



A Survey of Image Processing and Two Dimension Image Recognition

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ABSTRACT

Computer Vision and Image processing is continually growing. During the past ten years, there has been a significant increase in the level of interest in computer vision, image recognition, soft computing techniques, neural networks etc. This paper reviews different research papers on Digital image, fundamental of digital image processing. Lastly, it focuses on the future scope of the image recognition.

Keywords: Image Recognition, Neural Network, Fuzzy Logic, Genetic Algorithm, Soft Computing.

INTRODUCTION:

Digital Image recognition is the ability of a system or software to identify objects, people, places, and actions in images. It uses machine vision technologies with artificial intelligence and trained algorithms to recognize images through a camera system.

Two dimension digital image is represented as an array of real or complex numbers represented by a definite number of bits. An digital Image is represented as a two dimensional function $f(x,y)$, where 'x' and 'y' are spatial (plane) coordinates and the amplitude of f at any pair of co-ordinates (x,y) represents the intensity or gray level of the image at that point. The digital image is one for which both the co-ordinates and the amplitude value of f are all finite, discrete quantities. Hence, a digital image is composed of a finite number of elements, each of which has a particular location value. These elements are called image elements, picture elements or pixels.

A digital image is discrete in both spatial coordinates and brightness and it can be considered as a matrix whose rows and column indices identify a point on the image and the corresponding matrix element value identifies the gray level at that point.

There are many sensors or devices to acquire images. Most of the device or sensors give a continuous voltage as output, which will be continuous in both amplitude and coordinates. To convert it a digital form, we have to sample this function in both co-ordinates and amplitude. Digitizing the co-ordinate values is called sampling. Digitizing the amplitude value is called quantization. The of sampling and quantization is a matrix of real number. Hence , an image can be represented as shown in figure 1.

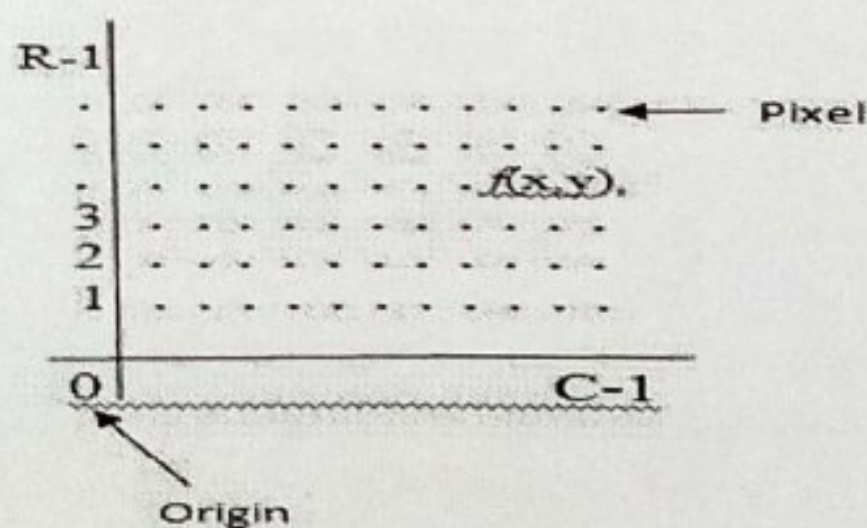


Figure 1

Image Representation

Where the function $f(x,y)$ is assumed to have 'R' rows and 'C' columns. The values of the coordinates are now discrete quantities.

Now, from the above notation, we can write the function $f(x,y)$ as shown in the below

$$f(x,y) = \begin{pmatrix} f(0,0) & f(0,1) & \dots & f(0,C-1) \\ f(1,0) & f(1,1) & \dots & f(1,C-1) \\ \vdots & \vdots & \ddots & \vdots \\ f(R-1,0) & f(R-1,1) & \dots & f(R-1,C-1) \end{pmatrix}$$

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Systematic Review of Dental Biometrics Based on Dental Radiographs

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ABSTRACT

Medical image processing is vital in several arenas of medical research and clinical observes. It greatly facilitates early detection and finding of diseases. This paper surveys a supplementary method in the area of medical image analysis for diagnosis of diseases in oral radiology using dental X rays in odontology. Dental X-ray image processing is widely used nowadays for identification of missing individuals or victims. Radiograph is more feasible and retrieved more information for feature extraction as compare to photograph.

Keywords: Dental radiograph (X-ray), dentistry, Computed Axial Tomography (CT Scan or CAT scan) Dental caries, Teeth segmentation, Gap Valley.

INTRODUCTION

In case of medical images human contribution and observation is of major importance. It's indeed a difficult task to grasp fine features in various alteration situations. The data obtained directly from X-ray acquisition device. It's going to yield a fairly poor image quality representation. Due to the role of a person's (dentist) interpretation supported his knowledge, skill and observation which could be vary from doctor to doctor., there are probabilities of error decide the correct medicinal treatment. Software developers together with area specialists have designed various standardized and scientific tools to attenuate the human fault within the case of deciding the proper treatment on the idea of visual opinion. Poor quality of dental images, the primary step is to grow the radiograph, there after segmentation is performed and followed by feature extraction which produces a part of interest which is exclusive for every individual. Feature vector thereby produced is matched with the database images. The image having minimum matching distance is taken into account to be the most effective potential match of the given query image. The primary step in human identification is dental image classification which relies on the way dental features are captured. they're classified as bitewing, periapical and panoramic dental images [5] as shown in figures Bitewing images include the features of both jaws signifying bite. While periapical images include only one jaw either upper jawbone called upper periapical image or mandible called lower periapical image. Panoramic images include features of both jaws including sinuses, nasal area, etc. However, for many dental processing bitewing images are used [6]. The dental radiograph consists of three regions namely background area (having lowest intensity), bone areas (having average intensity) and teeth areas (having highest intensity). In some cases, the intensity of bone area and teeth area are nearly same.

A dental x-ray provides valuable diagnosis information to dentists like passage way treatment, detection of caries and the other anomalies. [1] within the current years, different methods of processing on image are actively used for the finding of oral diseases in odontology. There are various diagnostic methods for odontology which include, Computed Axial Tomography (CT Scan or CAT scan), Ultrasonography (US), Panoramic Imaging, Intra Oral and additional Oral Radiography and MRI. These tomography systems are helpful in confirming the various kinds of dental disease infections. By using the radiographs of teeth, experts can find the Periodontal, Swelling, Interdental bone Loss, Extra Teeth, Impacted teeth, Cysts, Malignancies, Developmental defects, [3] Future Malocclusion

Types of Diseases

Enamel Caries:

In dental x-ray images, enamel caries may be predictable by a loss on the interproximal surfaces of the enamel. To be detectable on a radiographic image there must be a 30% to 50% change within the mineral content of the enamel lesion.

Dentinal Caries

Dentinal Caries is recognized by noting the focal loss of dentinal radiopacity. Dentin caries is also discerned inter-proximally, on the occlusal surface, buccally/lingually, or on root surfaces.

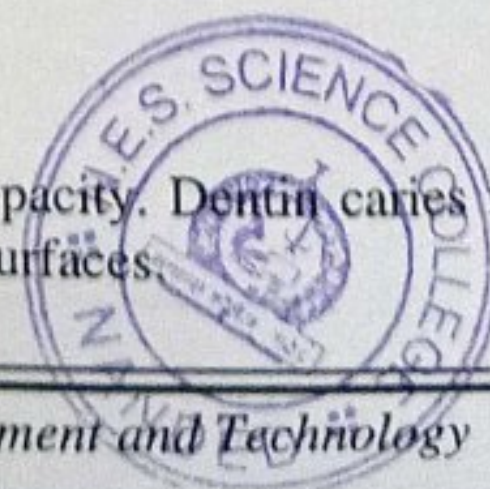


Image Segmentation Technique: A Systematic Literature Review

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Abstract:- According to a human observation image segmentation is the process of dividing the image into non-overlapping meaningful regions. The main objective of an image segmentation is to divide an image into many sections for the further analysis, so we can get the only necessary or a segment of information. The partitioning the image will be based on some image features like color, texture, pixel intensity value etc. The goal of this paper is to study the image segmentation techniques. It is a process of dividing the image into multiple parts, which are used for identifying objects and other relevant information. Image segmentation bridges a gap between the low-level image details and high-level image components. The role of segmentation is crucial for the tasks that require image analysis.

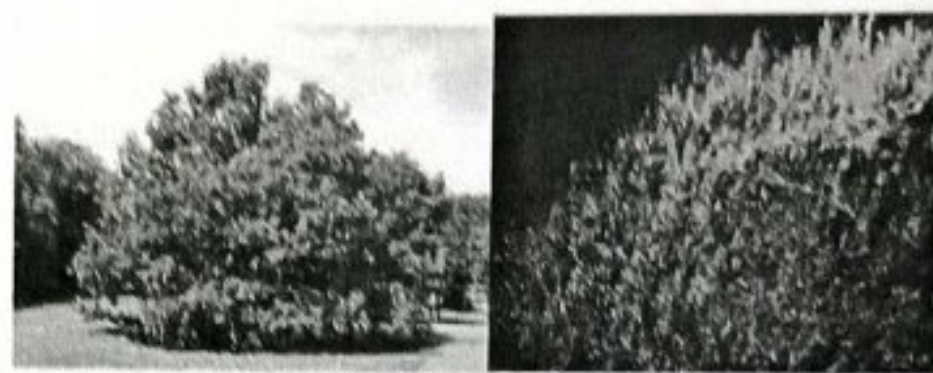
Keywords : OCR, Multispectral, pixel, GIF,

I. INTRODUCTION

Image segmentation is a branch of digital image processing which focuses on partitioning an image into different parts according to their features and properties. The primary goal of image segmentation is to simplify the image for easier analysis. In image segmentation divide an image into various parts that have similar attributes. The parts in which dividing the image are called Image Objects. By using image segmentation techniques, can divide and group-specific pixels from an image, assign them labels and classify further pixels according to these labels, can draw lines, specify borders, and separate particular objects (important components) in an image from the rest of the objects. Every image is a set of pixels and the process of dividing or partitioning that pixel on the basis of similar characteristics is known as segmentation.

Types of Digital Images: -Following are the type of images.:

- 1) binary
- 2) gray -scale
- 3) color
- 4) multispectral.



1. Binary image: Binary images are the simplest type of images and can take on two values, typically black and white, or 0 and 1. A binary image is referred to as a 1-bit image because it takes only 1 binary digit to represent each pixel. These types of images are frequently used in applications where the only information required is general shape or outline, for example optical character recognition (OCR). Binary images are often created from the gray-scale images via a threshold operation, where every pixel above the threshold value is turned white ('1'), and those below it are turned black ('0')

2. Gray-scale images: Gray-scale images referred to as monochrome (one-color) images. They contain gray-level information, no color information. The number of bits used for each pixel determines the number of different gray levels available. The typical gray-scale image contains 8bits/pixel data, which allows us to have 256 different gray levels. The figure below shows examples of gray-scale images. In applications like medical imaging and astronomy, 12 or 16 bits/pixel images are used. These extra gray levels become useful when a small section of the image is made much larger to discern details.

3. Color images: Color images can be modeled as three-band monochrome image data, where each band of data corresponds to a different color. The actual information stored in the digital image data is the gray-level information in each spectral band. Typical color images are represented as red, green, and blue (RGB images). Using the 8-bit monochrome standard as a model, the corresponding color image would have 24-bits/pixel (8-bits for each of the three color bands red, green, and blue).

4. Multispectral images: Multispectral images typically contain information outside the normal human perceptual range. This may include infrared, ultraviolet, X-ray, acoustic, or radar data. These are not images in

An efficient, ultrasound induced ring closure of hydroxy chalcone in 2-ethoxy ethanol as an green reaction medium and study of antimicrobial potential.

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Abstract

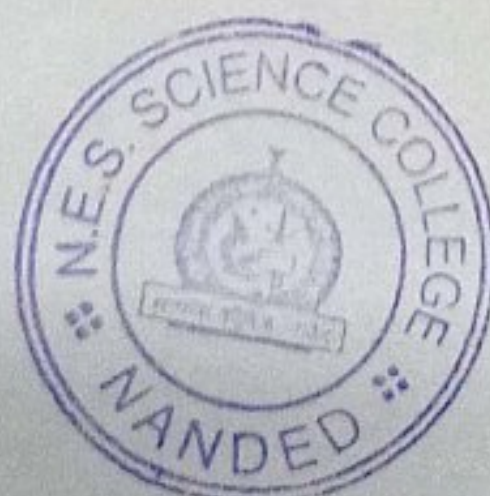
An improved sonochemical condensation has been reported between chloro-substituted hydroxyl chalcones and hydrazine hydrate in 2-ethoxy ethanol as an efficient & alternative reaction medium in presence of sodium acetate and acetic acid to afford 2-pyrazolines. The pyrazolines were obtained in good to excellent yields (80-90%), and were characterized by conventional spectral data and evaluated for their antimicrobial potential. It is observed that the work-up is simple and the results obtained indicate that, unlike classical heating, ultrasound irradiation results in higher yields, shorter reaction times (1.5-2.5h) and milder reaction conditions. The investigation of antimicrobial potential revealed that all the synthesized compounds shows good to moderate growth inhibiting effect against microorganism tested.

Keywords: 2- pyrazolines, 2-ethoxy ethanol, chalcones, ultrasound, cyclocondensation, antimicrobial activity

Specification Table

Subject area	Organic Chemistry
Compounds	Chloro-substituted 2-pyrazoline derivatives
Data category	Synthesized and biological data
Data acquisition format	¹ HNMR, IR, Mass spectra, Elemental analysis.
Data type	Experimental
Procedure	A series of Chloro-substituted 2-pyrazoline derivatives have been synthesized and characterized by spectral data and screened for their biological potential.
Data accessibility	Data is within the article.

1. Rationale



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ECB MICROWAVE-INDUCED, EFFICIENT, CONVENIENT AND RAPID SYNTHESIS OF BENZYLOXYCHALCONES AS POTENT GROWTH INHIBITOR

Nagesh Deshmukh^[a], Sainath Zangade^[b] and Avinash Shinde^{[a]*}

Keywords: Chalcones; Claisen-Schmidt condensation; microwave irradiation; antibacterial activity; antifungal activity.

A novel series of substituted chalcones containing benzyloxy moiety (3a-3h) was synthesized by microwave induced Claisen-Schmidt condensation of 2-acetyl-1-naphthol and its halo derivatives with different substituted aromatic aldehydes. All the synthesized chalcones were characterized by spectral analysis and screened for their antibacterial and antifungal effectiveness by using standard methods. It is found that the microwave irradiation technique is superior in terms of considerable increase in the reaction rate, yields and shortening the reaction time. The investigation of antimicrobial screening revealed that compounds (3a-3d) containing benzyloxy group at para position of aldehyde ring of chalcones possessing more potent antimicrobial activity.

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assigned on the basis of ¹H NMR, IR and GC-MS analysis. The compounds were tested for their anti-bacterial and anti-fungal activities by standard methods.

INTRODUCTION

Chalcone is generic term given to compounds bearing 1,3-diphenyl-2-propen-1-one framework.¹ Chalcones and their derivatives are polyphenolic compounds of flavonoids family. They have been found in many plants as metabolic precursors of other flavonoids and isoflavonoids.² It is noteworthy to mention that the presence of chalcones have been reported in plants traditionally employed for therapeutical purposes.³ Chemist have been attracted towards the nucleus of chalcones due to their relatively simple structures and wide variety of pharmacological activities.⁴⁻⁷ Chalcone based compounds have been reported to exhibit anticancer,^{8,9} anti-inflammatory activity,^{10,11} anti-ulcerative,¹² analgesic,¹³ anti-viral,¹⁴ anti-fungal,¹⁵ anti-malarial¹⁶ and anti-bacterial activity¹⁷ etc. which may be altered depending on the type of substituents on aromatic rings. Chalcones are synthesized by Claisen Schmidt condensation, which involve cross aldol condensation of suitable benzaldehyde derivatives and acetophenone derivatives by base catalysed or acid catalysed reactions followed by removal of water molecule. Synthetic and naturally occurring chalcones have been extensively studied and developed as one of the pharmaceutically important molecules. Therefore, in the present investigation it has been considered worthwhile to synthesize some new chalcone derivatives that may be of value in development of new, potent, selective and less toxic antimicrobial agent by conventional and microwave irradiation methods. Microwave induced enhancement of organic reaction is gaining popularity as a non-conventional technique for rapid synthesis.¹⁸ The important features of this technique are easy access to high temperature, safe and environmentally benign techniques with shorter reaction time.

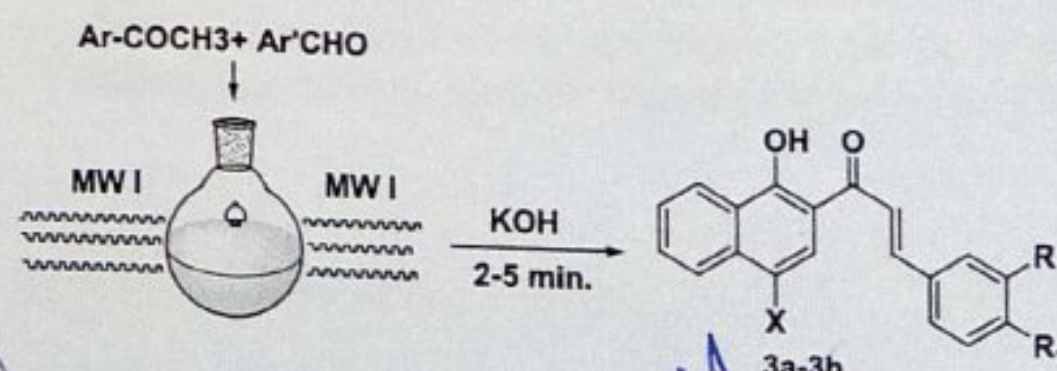
The synthesized compounds were purified by recrystallization and chromatography. The compounds were

EXPERIMENTAL

Melting points were determined in an open capillary tube and are uncorrected. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ¹H NMR spectra were recorded on a Gemini 300-MHz instrument in CDCl₃ as solvent and TMS as an internal standard. The mass spectra were recorded on EISHIMADZU-GC-MS spectrometer. Elemental analysis was carried out on a Carlo Erba 1108 analyzer. Synthon-3000, Anton Paar reaction system was used for microwave synthesis. The purity of products was checked by Thin Layer Chromatography (TLC) on silica gel. All solvents and chemicals were purchased from Alfa chemicals and used without further purification.

General procedure for synthesis of chalcones (3a-3h)

Equimolar quantities (0.001 mol) of 2-acetyl-1-naphthol or its halo derivative and respective aromatic aldehydes (0.001 mol) were mixed and dissolved in minimum amount (5 mL) of ethanol. To this, catalytic quantity of aqueous KOH solution was added slowly and mixed. The entire reaction mixture was microwave irradiated for about 2-5 min at 180 W. The reactions were monitored through TLC using solvent system benzene:ethyl acetate (8:2), when the reaction was complete the reaction mixture was cooled in an ice bath and product thus formed was filtered, washed with distilled water and recrystallized from ethanol.



Scheme 1. Synthesis of Chalcones under Microwave condition



Synthesis of 2-Hydroxynaphthyl Pyrazolines Containing Isoniazid Moiety: A Potential Antitubercular Agent



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Abstract: The new series of pyrazolines derivatives containing isoniazid moiety were synthesized from 2-hydroxynaphthyl functionalized chalcones and isoniazid using sodium hydroxide as a base in 2-ethoxy ethanol. We evaluated their antitubercular activity against *Mycobacterium tuberculosis* strain (H₃₇R_v) by Microplate Alamar Blue Assay (MABA). Some of the tested compounds **3a**, **3b**, and **3c**, were found to have higher antitubercular activity than the selected standard drugs, whereas compounds **3d**, **3e**, **3i** and **3j** were found to have higher antitubercular activity than Streptomycin and same as that of Pyrazinamide and Ciprofloxacin, while remaining compound showed moderate activity. Whereas it is found that the disubstituted halogen compound and electron-withdrawing group on the phenyl ring are important substitutions for an increase in antitubercular activity.

Keywords: Chalcones, pyrazolines, isoniazid, antitubercular activity, 2-hydroxynaphthyl pyrazolines, antitubercular agent.

1. INTRODUCTION

Tuberculosis (TB) is the significant continual transmissible bacterial disease caused by *Mycobacterium tuberculosis*. One of the main causes of TB is morbidity which results in death all over the world. More or less 33% of the world's population is presently living with this disease [1]. Almost two billion people are infected and about 8.7 million new cases and 1.4 million deaths were reported by the World Health Organization (WHO) in 2013 and has predicted that by the year 2020 there will be one billion new active cases if new anti-TB drugs or treatments are not developed [2-4].


A recent survey indicates that the leading mortality caused by HIV/AIDS is closely associated with tuberculosis. Improved therapy for tuberculosis is reorganized as a major need for developing countries as well as developed countries [5]. Current chemotherapy of tuberculosis is not likely to be successful in retroviral infected patients throughout the world. Resistance of *Mycobacterium tuberculosis* strains by existing antitubercular agents is also an increasing problem worldwide [6]. Therefore powerful novel antitubercular agents, being new mechanism of action, is needed to develop

for the treatment of complex tuberculosis cases [7]. Hence, selected nitrogen containing heterocyclic compounds such as pyrazolines have received notable awareness in the recent years due to their diverse pharmacological and biological activities such as antitubercular [8-12], antidepressant [13], antifungal [14-17], antimoebic [15], anticonvulsant [16-17], antitumor [18], anti-TB [19-22], anti-HIV [23], anticancer [12, 24] and anti-inflammatory [25]. Pyrazoline and its derivatives occupied a unique place in the chemistry of nitrogen heterocyclic compounds because of their varied biodynamic properties [26-28] and isoniazid containing pyrazolines reported to possess diverse biological activities [29-31], it is also a long familiar pharmacologically active antitubercular compound which is a forefront drug employed in the treatment of tuberculosis.

The structure-activity relationship is the link between the structure of a synthesized compound and its biological activity. Chemists use various synthetic techniques to introduce different groups of the bioactive compound and test for biological activity [32, 33]. Pyrazolines also influence the substitution pattern on the structure activity relationship (SAR). This study on the effect of different pyrazolines exposed some significant remarks on the influence that structural changes may affect the antitubercular and antibacterial activity [34, 35]. The present study investigates the influence of the different substitution patterns in pyrazolines on their antitubercular activity against *Mycobacterium tuberculosis*.

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IN-VITRO EVALUATION OF SELECTED CHLORO-CHALCONES FOR ANTIOXIDANT ACTIVITY

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Abstract : Synthetic chalcones having Chloro substituent (3a-3f) along with different functionality on the ring. Were examined in-vitro for their antioxidant abilities by DPPH (2,2-diphenyl-1-picryl hydrazine) radical scavenging activity and OH radical scavenging activity. The synthetic chloro-substituted chalcones were found to be reactive towards DPPH radical and also possess good to moderate OH radical scavenging activity. These findings suggest that these chloro-substituted chalcones can be considered as potential antioxidant agents which might be further explored for the design of lead antioxidant drug candidates.

Keywords - Chloro-chalcones, antioxidant, radical scavenging activity.

I. INTRODUCTION

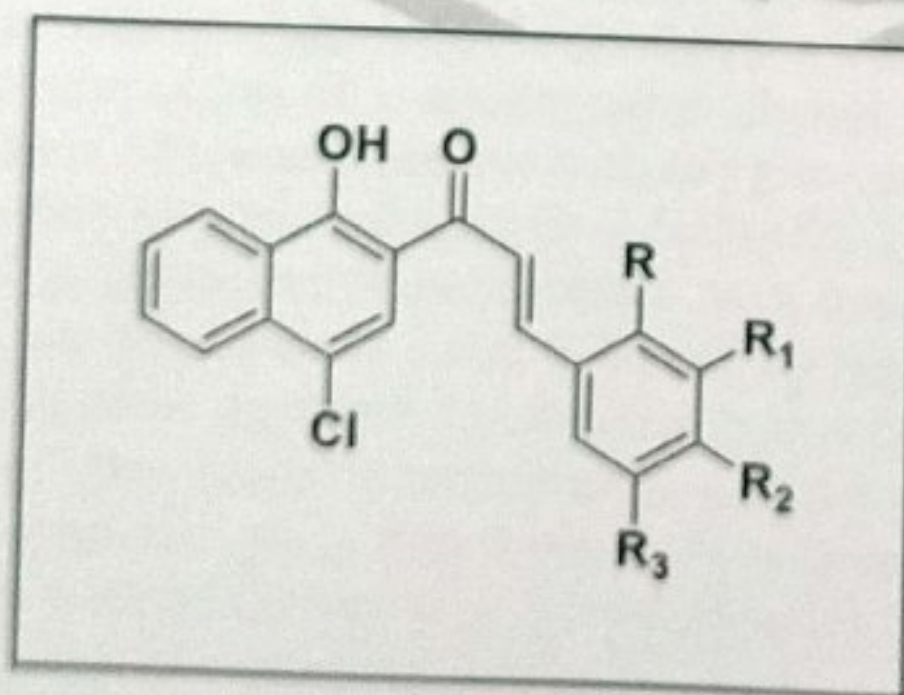
There is increasing experimental, clinical and epidemiological evidence highlighting an participation of free radicals and reactive oxygen species (ROS) in a variety of human diseases including cancer, inflammatory disorders and various degenerative ailments associated with aging.¹ Antioxidants are chemical substances, which scavenge free radicals and ROS thereby minimizing the burden of oxidative stress generated in the body.² Moreover, numerous experimental studies have suggested the importance of antioxidants as an alternative therapeutic approach for the treatment of several human ailments such as cardiovascular diseases, various types of cancer, and several inflammatory disorders.³⁻⁵

Antioxidants are compounds capable of preventing and even counteracting the damage caused in human tissue by the normal effects of physiological oxidation. A lot of research has shown that antioxidants can play a role in preventing the development of some chronic diseases. In addition to those mentioned previously, diseases such as atherosclerosis, emphysema, iron overload, malaria, muscular dystrophy, retinal degeneration, and rheumatoid arthritis are but a few examples where research has shown the likelihood of direct links and the possibility of positive dietary and perhaps even nutraceutical interventions.

Chalcones basic structure includes two aromatic ring bound by an α, β -unsaturated carbonyl group, a unique template associated with very diverse application.⁶ Due to the presence of the reactive keto, vinylenic group, chalcones and their analogues have been reported to be antioxidant.⁷ Hydroxyl and phenyl substituents are associated with antioxidant properties. In the present investigation the antioxidant activities of selected chloro-substituted chalcones with various substituents attached are described.

II. EXPERIMENTAL

2,2-Diphenyl-1-picrylhydrazine (DPPH) was obtained from Sigma-Aldrich. glutathione (GSH) were obtained from s. d. Fine Chemicals Ltd. Mumbai. All other chemicals used were of AR grade and were obtained from commercial sources. The Synthetic chalcones under study were selected from the series of chloro-substituted chalcones which is synthesized. The details of the synthetic methodology and characterization of the test compounds has been reported elsewhere.⁸



3a. R= H, R₁= OCH₂CH₃, R₂= OH, R₃=H

3b. R= H, R₁=OCH₂CH₃, R₂= OH, R₃=Br

3c. R= O-CH₃, R₁=H, R₂= H, R₃=Cl

3d. R= OH, R₁=H, R₃= Cl, R₂=H

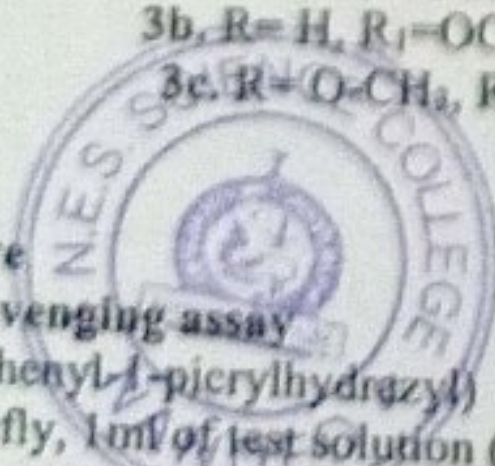
3e. R= OH, R₁= R₃= Br, R₂=H

3f. R= OH, R₁= R₃= I, R₂=H

General procedure

DPPH radical scavenging assay

DPPH (2, 2, diphenyl-1-picrylhydrazyl) radical scavenging assay was carried out as per reported methods with slight modification.⁹ Briefly, 1ml of test solution (Test compound) added to equal quantity of 0.1mM solution of DPPH in ethanol. After 20 min incubation at room temperature, the DPPH reductions were measured by reading the absorbance at 517 nm. Ascorbic acid used as reference compound.



Microwave-assisted synthesis of some new bis-1,3-benzoxazines and their antimicrobial activity

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Abstract: A series of bis-1, 3-benzoxazines (**3a-f**) were synthesized from reduced product of propane-1, 3-diamine Schiff bases in the presence of formalin under conventional heating and microwave irradiation. The structures of newly synthesized diamines and bis-1, 3-benzoxazines were established on the basis of spectroscopic data. Further, all the synthesized compounds were screened for antimicrobial activity. Some of the compounds showed very good activity compared to standard drugs against all pathogenic bacteria and fungi.

Keywords: Bis-schiff bases, bis-1, 3-propane diamines, microwave irradiation, antimicrobial activity. ©2020 ACG Publications. All right reserved.

1. Introduction

3, 4-Dihydro-2H-1,3-benzoxazines are bicyclic heterocycles that are of significant interest in the polymeric and pharmacological field. Benzoxazines are important class of benzofused heterocycles with wide spectrum of biological activity such as antimicrobial^{1,2}, analgesics³, antibacterial⁴, neuroprotective⁵, D₂ receptor antagonistic activity⁶, antimycobacterial⁷, antiviral⁸, antifungal activity⁹ these type of compounds have been important subject of researchers. In addition, N-substituted 3,4-dihydro-2H-1,3-benzoxazines are potential intermediates for the preparation of phenol formaldehyde resins¹⁰. Hence the synthesis of these compounds including attracted great interest. Several methods have been reported for the preparation of these compounds in literature for example, an important method was developed by using mannich-type condensations of phenol, with primary amines and two equivalent of formaldehyde¹¹. Condensation of *o*-aminomethyl phenol with an aldehyde or ketones provided another route¹². Reactions of primary amines with oxygen-containing dihalocompounds established a way to prepare 3,4-dissymmetric-substituted 3,4-dihydro-1,3-benzoxazines¹³. Recently, rhodium-catalyzed reactions of 2-(alkenyloxy)benzylamines have been developed as a way to generate 3,4-dihydro-1,3-benzoxazines an allylic cleavage followed by regioselective carbonylation at the internal carbon atom¹⁴. However, some drawback existed in previous methods. Moreover, the presence of some functional groups in the benzoxazine is incompatible with the use of this direct synthetic methodology. This is the case of the phenolic group that is desirable to prepare new polymeric materials with well-defined properties. This fact and the aim to prepare the bis-1,3-benzoxazine and its antimicrobial studies lead us to explore the utility of alternative synthetic routes.

The microwave induced enhancement of organic reactions is currently a focus of attention for chemists due to the decreased reaction time, improved yields and easier work up as compared to conventional methods¹⁵. In microwave synthesis, to avoid accidents low boiling, toxic and poisonous solvents are often avoided. The use of microwave for the synthesis of organic compounds has proved to

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Research article

Synthesis, characterization, spectroscopic studies and biological evaluation of Schiff bases derived from 1-hydroxy-2-acetonaphthanone



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ABSTRACT

The four Schiff bases (I - IV) were synthesized by the condensation reaction of 1(1-hydroxynaphthalen-2-yl)ethanone, 1-(4-chloro-1-hydroxynaphthalen-2-yl)ethanone and 1-(4-bromo-1-hydroxynaphthalen-2-yl)ethanone with propane-1,3-diamine and pentane-1,3-diamine. The structural analysis is done by UVvis., FT-IR, ^1H NMR, ^{13}C NMR, LCMS and elemental analyses. These compounds were assayed for antibacterial (*Escherichia coli* and *Salmonella Typhi*) activity and antioxidant (2,2-Diphenyl-1-Picryl Hydrazyl(DPPH) and Hydroxyl radical scavenging method) activity. The antibacterial and antioxidant activities of synthesized Schiff bases exhibited better degrees of inhibitory effects. Among these, Schiff base 2,2'-((propane-1,3-diylbis(azanylylidene))bis(ethan-1-yl-1-ylidene))bis(4-chloronaphthalen-1-ol) (II) exhibited excellent antibacterial activity with MICs of 0.12, 0.25, 0.5 and 1 mg/ml against *E. coli* and *Salmonella Typhi*. Furthermore, two Schiff bases such as, 2,2'-((propane-1,3-diylbis(azanylylidene))bis(ethan-1-yl-1-ylidene))bis(naphthalen-1-ol) (I) and 2,2'-((pentane-1,3-diylbis(azanylylidene))bis(ethan-1-yl-1-ylidene))bis(4-bromonaphthalen-1-ol) (IV) exhibited promising antioxidant activity.

1. Introduction

Schiff bases contains azomethine (-C=N-) linkage and are usually derived by the condensation of carbonyl compounds (aldehydes/ketones) with primary aliphatic/aromatic/heteroaromatic amines. Schiff bases are known for their antitumor [1, 2, 3, 4, 5, 6, 7, 8], antifungal [9, 10, 11, 12, 13], antiviral [14], antibacterial [9, 10, 11, 12, 15, 16, 17] and anticancer [18, 19] activities. Schiff bases find many applications including acid catalyst [20, 21, 22, 23], reduction catalyst [24, 25], oxidation catalyst [26, 27, 28, 29, 30, 31], dye [32, 33] and it also exhibit special liability towards metal ions [34, 35, 36, 37]. The intermolecular hydrogen bonding ability and proton transfer equilibria of Schiff bases offer them excellent bioactivity [38]. Metal complexes derived from Schiff bases have been used as insecticides, pesticides, bactericides and fungicides [39, 40]. Furthermore, metal complexes of Schiff bases harbouring hetero atoms such as N, S, O etc. exhibit several bio potencies [41] including antitumor [42, 43], antioxidant [44], antibacterial [45, 46], antimalarial [47] antifungal [48], anticancer [49, 50, 51], antiviral [52], anti-inflammatory [53] and anti-HIV [54] activities. Infections with Gram-negative bacteria are especially worrisome than that of Gram-positive bacteria [55]. Considering the magnitude of ever-growing antibacterial resistance, it is necessary to discover novel Schiff bases with

resistance improved pharmacological profile. We chose to synthesize a library of Schiff bases from 1-hydroxy-2-acetonaphthanone and diamines having 3-carbon spacer since it offers tetradentate and flexible nature to the new Schiff bases [56, 57, 58, 59, 60].

In present work, we report here in synthesis, characterization, antibacterial and antioxidant activity of four new Schiff bases derived from 1-(1-hydroxynaphthalen-2-yl)ethanone, 1-(4-chloro-1-hydroxynaphthalen-2-yl)ethanone and 1-(4-bromo-1-hydroxynaphthalen-2-yl)ethanone with propane-1,3-diamine and pentane-1,3-diamine. The structures of these Schiff bases were confirmed by UV, FT-IR, ^1H -NMR, ^{13}C NMR, and Mass spectroscopic tools, and additionally by Elemental analysis.

2. Experimental

Chemicals were obtained from AURA, SPECTROCHEM & TCI and were used as received without any further purification.

2.1. Synthesis

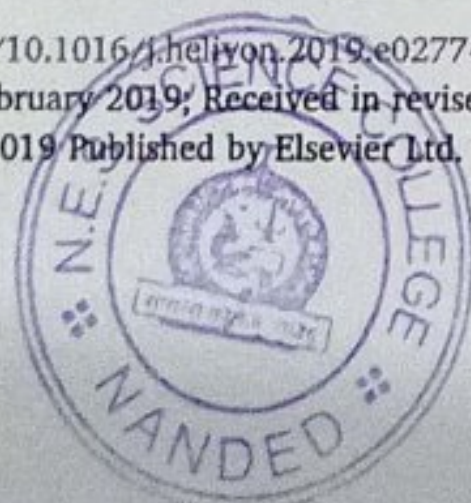
The tetradentate Schiff base, 2,2'-((propane-1,3-diylbis(azanylylidene))bis(ethan-1-yl-1-ylidene))bis(naphthalen-1-ol) (I) and 2,2'-((propane-1,3-diylbis(azanylylidene))bis(ethan-1-yl-1-ylidene))bis(4-chloronaphthalen-

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Section A: Green Chemistry



Research Note

CODEN (USA): IJGHAY

Epoxidation and antimicrobial activity of Chalcones containing benzyloxy moiety

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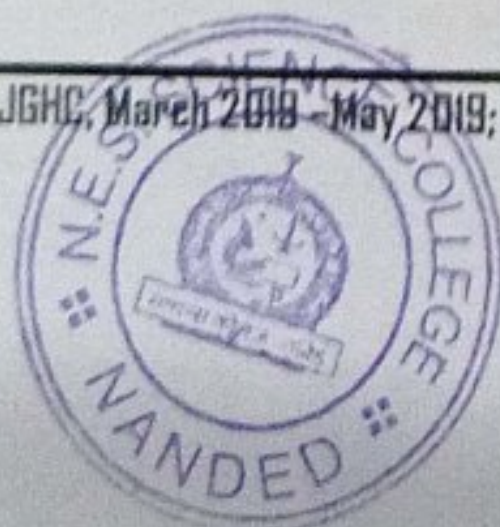
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Abstract: Chalcone epoxides are important intermediates for the synthesis of various heterocycles. Eight different chalcones were oxidized with hydrogen peroxide and potassium hydroxide in order to produce the corresponding epoxides containing benzyloxy moiety and all the synthesized epoxides are evaluated for their antimicrobial potency. Most of the synthesized compounds (**3a-3h**) showed good to moderate activity.

Keywords: Chalcone epoxide, Hydrogen peroxide, Antimicrobial activity.

INTRODUCTION

Chalcones and chalcone epoxides are important classes of organic compounds with distinct structural features and high synthetic utility^{1,2}. Chalcones, also known as α - β -unsaturated ketones, are abundant in edible plants and are considered to be precursors of flavonoids and isoflavonoids. Chalcones bear a very good synthon so that a variety of novel heterocycles with good pharmaceutical profiles can be designed. Chalcone epoxides (α , β -epoxyketones) not only undergo the usual reactions of epoxides, but are also susceptible to several useful reactions owing to the presence of carbonyl groups. Chalcones and chalcone epoxides display an enormous number of biological activities, including anti-cancer³, anti-microbial⁴,



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Growth Inhibitory Properties of Synthetic Chalcones

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Abstract: Background: In the present study, chalcones were synthesized from 2-hydroxy-1-acetonaphthone and substituted aromatic aldehydes were synthesized by Claisen Schmidt condensation reaction using potassium hydroxide as a base. The synthesized chalcones were purified by recrystallization from ethanol and evaluated for antibacterial activity by well diffusion method. The antibacterial activity was evaluated against *Bacillus licheniformis*, *Bacillus species*, *Escherichia coli* and *Staphylococcus aureus* using Ciprofloxacin as a standard.

Methods: The target molecules were prepared by reacting 2-hydroxy-1-acetonaphthone and various substituted aromatic aldehyde in the presence of suitable condensing agents. The structure of synthesized compounds was confirmed on the basis of elemental analysis, IR, ¹H NMR and ¹³C NMR spectral data. These synthesized compounds were also screened for antibacterial activity.

Results: In the present study, free hydroxyl group in position 2 or 4 of aldehyde ring of synthesized chalcones appears to be a very important requirement in increasing the activity (2-5 and 8-13). When the hydroxyl group in position 4 is alkylated (14, 15), the chalcones become less active. When more complex substituent is present on the aldehyde ring (6, 7) there is a decrease in the activity.

Conclusion: Newly synthesized chalcones (1-15) show good and moderate antibacterial activity. We believe that the new hydroxy substituted (in aldehyde ring) chalcones (2-5 and 8-13) reported in this work may provide an interesting insight for further optimization.

Keywords: 2-hydroxy-1-acetonaphthone, chalcones, antibacterial activity, Minimum Inhibitory Concentration (MIC), hybrid molecules, aromatic aldehydes.

1. INTRODUCTION

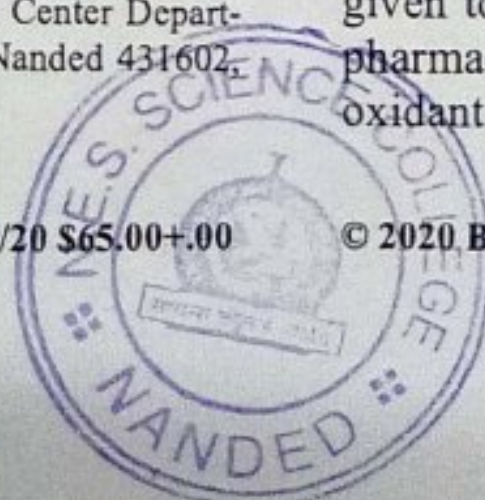
The discovery of antibiotics has long been regarded as one of the most significant medical achievements of the twentieth century. Antibiotics have saved millions of lives [1] and enabled important medical procedures, including surgery and cancer chemotherapy. The emergence and spread of antibacterial resistance in all geographical areas, including in bacteria that cause hospital- and community-acquired infections, is, however, jeopardizing the effectiveness of these potentially life-saving treatments [2]. The threat includes the spread of multidrug-resistant bacteria, and infections with no therapeutic options have been reported [3].

The number of life threatening infections caused by multidrug-resistant Gram-positive pathogens has reached an alarming level in hospitals and the community infections caused by these organisms create a serious challenge to the scientific community and the need for an effective therapy has led to a search for novel antibacterial agents [4]. Antibacterial agents are among the most commonly used and

misused of all drugs [5] they reduce or completely block the growth and multiplication of bacteria. This has made them unique for the control of deadly infectious disease caused by a variety of pathogens [6]. Although deaths from bacterial infection have dropped in the developed worlds and these are still the major cause of death in the developing world. The inevitable consequence of the widespread use of antibacterial agents has been the emergence of antibiotic-resistant pathogens, fueling an ever-increasing need for new drugs. In the design of new compounds, development of hybrid molecules through the combination of different pharmacophore in one structure may lead to compounds with increased antibacterial activity.

Chalcones, considered as the precursors of flavonoids and isoflavonoids [7], are abundant in edible plants. Chemically they consist of three carbons α , β -unsaturated carbonyl system. Condensation of aromatic aldehydes with aromatic ketones in the presence of catalyst yields chalcones [8]. Chalcones commence a diversity of chemical reactions together with the synthesis of pyrimidine, isoxazoles and pyrazolines. Chalcones act as mediators in the synthesis of beneficial therapeutic compounds special attention has been given to chalcones due to their simple structure and diverse pharmacological activities including anticancer [9-11], antioxidant [12-14], antiinflammatory [15, 16] antimicrobial

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A cleaner and convenient approach to Amines: Reduction of Symmetric diimines using NaBH_4

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Abstract

Symmetric diimines have been reduced to their corresponding amines by means of NaBH_4 using MeOH as a solvent at room temperature. The reaction time and yield are 1-1.5 hr and 65-80% respectively. Reduction process is very effective, inexpensive and clean for synthesis of diamines in good yield. The structures of the compounds are supported by FTIR, mass spectrometry, ^1H and ^{13}C NMR spectral data.

Keywords: NaBH_4 reduction, symmetric diamines, symmetric diimines, spectral data.

Introduction

Synthesis of amines has received more attention than the preparation of many other functional groups in organic chemistry.¹ With the growing repertoire of biologically relevant nitrogenous molecules, it is the need for efficient synthetic methods to prepare amines as useful intermediates.^{2,3} Due to their interesting physiological activities, secondary amines in particular are extremely important pharmacophore in numerous biologically active compounds, which have greatly been touted in the area of drug discovery.⁴ This field has also spurred intense activity on solid phase synthesis⁵ as well as combinatorial library generation where the secondary amines can be utilized as an important scaffolding for further manipulations.⁶

The reduction of imines is one of the most significant and useful method for preparation of the corresponding amines.⁷ Imines can be effectively reduced to amines by several reducing reagents.^{8,9} Sodium borohydride is a powerful reducing agent and has been employed in the reduction of a range of functional groups.^{10,11} In the present work an effort has been made to reduce some symmetric imines by NaBH_4 which is simple, safe and inexpensive reagent, and reduction can be achieved within 1-1.5 hrs.

Material and Methods

Melting points were determined in an open capillary tube and are uncorrected. The chemicals and solvents were of laboratory grade and were purified. Completion of the reaction was monitored by thin layer chromatography using hexane/ethyl acetate as mobile phase on pre coated sheets of silica gel-G (Merck, Germany) using iodine vapor for detection. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ^1H and ^{13}C NMR (70MHz) spectra were recorded in DMSO-d_6 with an Advance spectrometer (Bruker, Germany) at 400-MHz frequency using TMS as an internal standard. The mass spectra were recorded on

EISHIMADZU-GC/MS spectrometer. Elemental analyses were performed on a Perkin-Elmer 240 CHN elemental analyzer.

General procedure for reduction of bis-Schiff bases: Into a 100mL flask 0.01 mole bis-Schiff base (1a-k)¹² and 20mL MeOH were placed in an ice bath and 0.03 mole NaBH_4 was added pinch wise during 10 min. with stirring. After complete addition of NaBH_4 , the reaction mixture was further stirred at RT for 1-1.5hr. The progress of the reaction was monitored by TLC. The solid separated on evaporation of solvent was filtered, washed with cold water and recrystallized from ethanol to get 2a-k.

4,4-((propane-1,3-diylbis(azanediyl))bis(methylene)) bis(2-ethoxyphenol) (2a): White solid. Yield 80%, m.p.132-135°C; IR: ν/cm^{-1} =3420 cm^{-1} (OH), 3280 cm^{-1} (NH), 2928 cm^{-1} (-CH); ^1H NMR: δ/ppm =1.35(t, 6H, -2 CH_3), 1.80 (m, 2H, - CH_2), 2.62 (t, 4H, - NCH_2), 3.80 (s, 4H, - CH_2), 4.10 (q, 4H, -2 OCH_2), 4.61 (s, 2H, -2NH), 8.40 (m, 6H, 2Ar-H), δ 10.10 (s, 2H, 2Ar-OH); ^{13}C NMR: 18, 29, 46, 50, 65, 118, 120, 130, 136, 150;. Anal Calc. $\text{C}_{21}\text{H}_{30}\text{N}_2\text{O}_4$ (374): C, 67.37; H, 8.02; N, 7.45. Found: C, 67.40; H, 8.31; N, 7.75.

4, 4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-bromo-6-ethoxyphenol) (2b): Faint brown solid. Yield 75%, m.p.127-130°C; IR: ν/cm^{-1} =3445 cm^{-1} (OH), 3320 cm^{-1} (NH), 2980 cm^{-1} (-CH); ^1H NMR: δ/ppm =1.40(t, 6H, -2 CH_3), 1.91 (m, 2H, - CH_2), 2.65 (t, 4H, - NCH_2), 3.9 (s, 4H, - CH_2), 4.2 (q, 4H, -2 OCH_2), 4.5 (s, 2H, -2NH), 8.6 (m, 4H, 2Ar-H), δ 10.2 (s, 2H, 2Ar-OH); ^{13}C NMR: 19, 30, 48, 52, 66, 119, 122, 133, 138, 155;. Anal Calc. $\text{C}_{21}\text{H}_{28}\text{Br}_2\text{N}_2\text{O}_4$ (530): C, 47.54; H, 5.28; N, 5.28. Found: C, 47.40; H, 5.31; N, 5.20.

4,4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-ethoxy-6-iodophenol) (2c): White solid. Yield 75%, m.p.129-131°C; IR: ν/cm^{-1} =3443 cm^{-1} (OH), 3305 cm^{-1} (NH), 2965 cm^{-1} (-CH); ^1H NMR: δ/ppm =1.38(t, 6H, -2 CH_3), 1.87(m, 2H, - CH_2), 2.70 (t, 4H, - NCH_2), 3.82 (s, 4H, - CH_2), 4.19 (q, 4H, -2 OCH_2), 4.20 (s, 2H, -2NH), 8.5 (m, 4H, 2Ar-H), δ 10.14(s, 2H, 2Ar-OH); ^{13}C NMR: 19, 31, 48, 52, 65, 119, 120, 134, 137, 158;. Anal Calc. $\text{C}_{21}\text{H}_{28}\text{I}_2\text{N}_2\text{O}_4$ (626): C, 40.25; H, 4.47; N, 4.28. Found: C, 40.10; H, 4.25; N, 4.30.

4,4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-methoxyphenol) (2d): White solid. Yield 85%, m.p.110-112°C; IR: ν/cm^{-1} =3428 cm^{-1} (OH), 3280 cm^{-1} (NH), 2943 cm^{-1} (CH); ^1H NMR: δ/ppm =1.72(m, 2H, - CH_2), 2.61(t, 4H, -2 CH_2), 3.70 (s, 4H, -2 NCH_2), 3.89 (s, 6H, -2 OCH_3), 4.60 (s, 2H, -2NH), 8.22 (m, 6H, 2Ar-H), δ 10.05(s, 2H, 2Ar-



ULTRASOUND ASSISTED SYNTHESIS OF CHLORO-SUBSTITUTED CHALCONES FOR THEIR ANTIFUNGAL ACTIVITY

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ABSTRACT

Abstract: Claisen- Schmidt condensation of chloro-substituted 2-acetyl-1-naphthol with aromatic aldehydes catalyzed by alkali results chalcones in 80-85% yield in alcoholic solvent under ultrasonic condition. The synthesized compounds are evaluated for their antifungal activity, the result showed all the compounds (3a-3f) showed good to moderate antifungal activity.

KEY WORDS

Chloro-substituted chalcones, sonication, Antifungal activity.

INTRODUCTION:

Chalcones constitute an important group of natural products and some of them possess wide range of biological activities such as antibacterial^{1,2}, anticancer^{3,4}, antitubercular⁵, antiviral^{6,7}, antiinflammatory⁸. The presence of reactive α - β unsaturated keto function in chalcones is responsible for biological activities, which may be changed by changing the position of substituents on aromatic rings. Synthesis of chalcones via claisen-schmidt condensation of aromatic aldehydes with acetophenones has been reported in literature. Some alkalis such as NaOH⁹, KOH¹⁰ have been used to catalyze the reaction. However, there were always some problems due to long reaction time or difficult work up.

A survey of literature show that many organic reactions have been accelerated by ultrasonic irradiation^{11,12}. The ultrasonic waves accelerate the reaction million-fold and many synthetically useful reactions are successfully accomplished^{13,14} as compared to conventional method. In present communication the reaction of chloro-substituted 2-acetyl-1-naphthol with aromatic aldehydes to forms chloro-substituted chalcones(3a-3f) is reported. The structure of compounds were assigned on the basis of elemental and spectral analysis. These

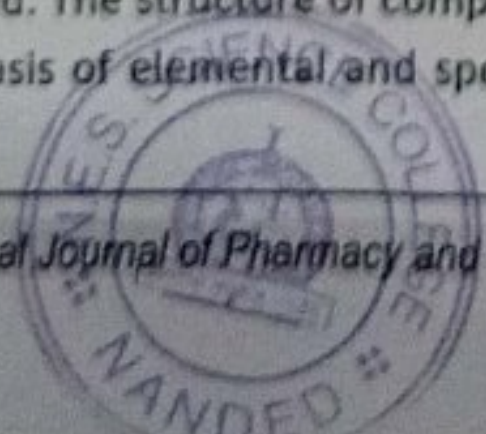
compounds were also screened for their antifungal activity.

MATERIAL AND METHOD:

Melting points were determined in an open capillary tube and are uncorrected. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ¹H NMR spectra were recorded on a Gemini 300-MHz instrument in DMSO as solvent and TMS as an internal standard. The mass spectra were recorded on EISHIMADZU-GC-MS spectrometer. Elemental analysis was carried out on a Carlo Erba 1108 analyzer. Sonication was performed in a Toshnival model SW-4 ultrasonic bath with frequency of 37 KHz and nominal power of 500 W. The purity of products was checked by Thin Layer Chromatography (TLC) on silica gel. All solvents and chemicals were purchased from Alfa chemicals and used without further purification.

General procedure for the preparation of chalcones by ultrasound irradiation method:

Chloro-substituted 2-acetyl-1-naphthol (1mmol), aromatic aldehydes (1mmol), 95% Ethanol (15ml) and 2N KOH (3ml) were taken into 100ml conical flask. The reaction mixture was sonicated by ultrasound irradiation in water bath at 30-35°C for 10-11 min. The



Nutrient Analysis of Soil from Nanded District, Maharashtra

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Abstract: The analysis of soil nutrient is done in order to measure the nutrient that is present in the soil and it provides all the necessary information that is required in order to set the target of nutrient application. It also allows the detection and monitoring of the changes in the parameters of soil. In the present study it was preferred to investigate the soil samples for its physico-chemical analysis of some parameters; fifteen representative samples were obtained and analyzed for its pH, EC, Nitrogen, Phosphorus, Potassium & Carbon.

Keywords: Soil analysis, Physico-Chemical, Soil nutrient

1. Introduction

The soil forms the intermediate zone between the atmosphere and the rock cover of the earth, the lithosphere. It also forms the interface between water bodies (hydrosphere) and the lithosphere and thus forming a part of biosphere. The soil may be defined as the uppermost weathered layer of the earth's crust in which are mixed organisms and products of their death and decay. It may also be defined as the part of the earth's crust in which plants are anchored. The soil is a complex organization being made up of some six constituents namely inorganic matter, organic matter, soil organisms, soil moisture, soil solution and soil air. Roughly, the soil contains 50-60% mineral matter, 25-35% water, 15-25% air and little percentage of organic matter (Chatwal et al, 2005). Soil fertility is one of the important factors controlling yield of the crops soil characterization in relation to evaluation of fertility status of the soil of an area or region is an important aspects in context of sustainable agricultural production because of imbalanced and inadequate fertilizer use couples with low efficiency of other inputs, the production efficiency of chemical fertilizer nutrients has declined tremendously under intensive agriculture in recent years (Yadav and Meena, 2009). Due to these in view and also lack of information on nutrients status to identify the emerging nutrient deficiency and to know the quality of soil, therefore Fifteen representative samples were collected to investigate the soil samples for its physico chemical analysis of some parameters like PH, Electrical conductivity, Nitrogen, Phosphorus, Potassium, Carbon in the soil from Nanded district.

2. Material and Methods

Nanded district lies in the eastern part of Maharashtra state as well as the eastern portion of marathwada region which corresponds to Aurangabad division. Total fifteen representative soil samples were collected in the depth of 0-20 cm from the surface of soil from different villages in Nanded area in the year 2020. The soil samples were preserved in polythene bags for further analysis. The chemicals and reagents used for analysis were of A.R. grade from S.D Fine and Merck. pH values were determined using Equiptronics pH- meter. For this 20 g soil sample was mixed

with 40 ml distilled water in 1: 2 ratio. The suspension was stirred occasionally with glass rod for 30 minutes and left for one hour. The combine electrode was inserted into supernatant and pH was recorded. pH value as a measure of the hydrogen ion activity of the soil water system and The most significant property of soil, Its effects on all other parameters of soil. Therefore, pH is considered while analyzing any kind of soil. If the pH is less than 6 then it is said to be an acidic soil, the pH range from 6-8.5 it's a normal soil and greater than 8.5 then it is said to be alkaline soil. Electrical conductivity is also a very important property of the soil; it is used to check the quality of the soil. It is a measure of ions present in solution The electrical conductivity of a soil solution increases with the increased concentration of ions. Electrical conductivity is a very quick, simple and inexpensive method to check health of soils. The electrical conductivity of a soil samples was determined on an Equiptronics digital electrical conductivity bridge for which 20g soil was added in 40ml distilled water. The suspension was stirred intermittently for half an hour and kept it for 30 minutes without any disturbances for complete dissolution of soluble salts. The soil was allowed to settle down and then conductivity cell was inserted in solution to take the reading to record the EC values.

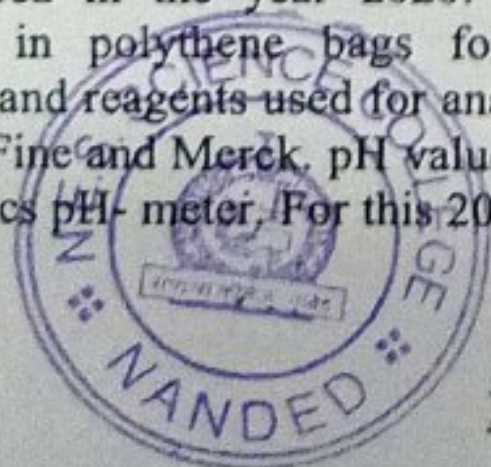
Organic matter is useful in supplying nutrients and water to the plants and also provides good physical conditions to the plants. The quantity of organic carbon in the soil was estimated by using modified Walkey-black method (Walkey and black, 1934). 1g finely ground dry soil sample was passed through 0.5mm sieve without loss and was taken into 500ml conical flask to this 10ml of 1N $K_2Cr_2O_7$ and 20ml con. H_2SO_4 were added and the contents were shaken for a minute and allowed to set aside for exactly for 30 minutes and then 200ml distilled water, 10ml phosphoric acid and 1ml diphenylamine indicator were added. The solution was titrated against standard ferrous ammonium sulphate (Mohr's salt) till colour changes from blue violet to green. The blank titration was also carried without soil. Nitrogen occurs in several forms: Nitrate(NO_3^-) and nitrite(NO_2^-) anions, ammonium(NH_4^+) and organic compounds. For high production, the application of N fertilizers can be done. This can be determined after the estimation of soil Nitrogen content by Potassium permanganate method (Hussain and Malik, 1985) Phosphorus is a most important element present

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Effect of Bio-fertilizers & Chemical fertilizers on productivity & quality parameters of Wheat: A Review

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Abstract

Plant nutrient plays significant role in the production of the crop as well as for the environment. The use of organic and inorganic fertilizers for the production of wheat crop is excellent. The only use of chemical fertilizers have disadvantages because they are not ecological friendly they pollutes our environment as well as kills the useful soil microorganisms, while on the other hand the use of biofertilizers are very beneficial for the crop growth and these are environmental friendly because they do not pollute our environment. The combined use of farmyard manure, chemical fertilizer and bio-fertilizer has beneficial effect on crop plants. The use of farmyard manure is very good because it increases the water holding capacity of soil, improves the infiltration rate of water. As a whole it increases the water holding capacity of soils. The research on various aspects of integrated nutrient on wheat is received.

Keywords: Fertilizers, Nutrients, Microorganisms, Wheat.

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I. Introduction

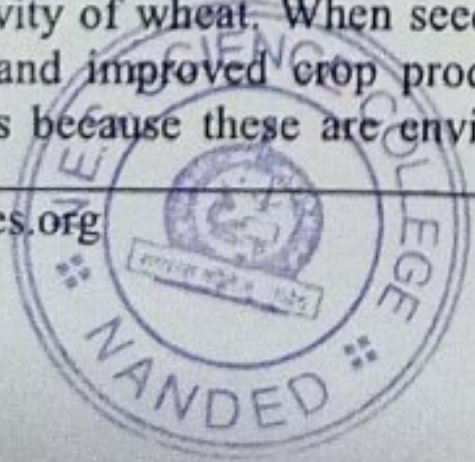
Wheat is the most important cereal crop worldwide and meets about two-third of the protein-energy needs of the world population 1. It is grown organically as well as inorganically, The demand of organically grown wheat is increasing in the world due to its high nutritional value 2. Organic farming has received attention during the last two decades due to its high-quality products 3, high price, and low market availability of inorganic fertilizers, especially in developing countries like Pakistan. Certified organic grains have higher values than inorganic products 4. Similarly, organic cropping system has higher nutrient use efficiency than conventional system 5. In contrast to mineral fertilizers, the organic manures add organic matter to soil improving its fertility, microbial activity, and water infiltration moisture holding capacity 6.

In most countries, agricultural systems are often incapable of supplying adequate micronutrients to efficiently attain the requirements of their populations 7. It is partially due to increasing grain yield demand from agricultural systems over the past 50 years. Therefore, to fill the gap between demand and supply, cropping intensity and fertilizer application have increased resulting in reduction of soil fertility 8. Moreover, excessive chemical fertilizers applications in an agricultural system may negatively affect surface water, groundwater, and atmosphere through leaching, runoff, and volatilization of nitrogen (N), respectively 9.

II. Literature Review

Effect of Bio-Organic fertilizers on wheat

Bio-fertilizers being essential components of organic farming play vital role in maintaining long term soil fertility and sustainability by fixing atmospheric nitrogen. Keep the soil environment rich in all kinds of micro- and macro-nutrients via nitrogen fixation, phosphate and potassium solubilization or mineralization, release of plant growth regulating substances, production of antibiotics and biodegradation of organic matter in the soil 10. These also play very important role to enhance the growth as well as the yield of crop plants. They involves in various biotic activities and sustainable for crop production 11. In the past the use of nitrogen fertilizers, green revolution, mono-cropping systems use to obtain maximum yield in less time. But now days there is judicious use of chemical fertilizers with nitrogen fixing inoculants and Rhizobium 12. Bio-fertilizers bring down the cost of chemical fertilizers e.g phosphorous, nitrogen and potassium. Bio-fertilizers contains microscopic microorganisms which are used as fertilizers for the growth of plants e.g *Azospirillum sp.* and *Azotobacter sp* 13. *Azotobacter* plays a very important role in the growth of plants especially it improves the yield of wheat. It is evident the bio-fertilizers like *Azotobacter* in combination have great prospect for increasing productivity of wheat. When seeds are inoculated with bio-fertilizers, they multiply and participate in nutrient cycling and improved crop productivity 14. Bio-fertilizers are the safe alternative to the use of chemical fertilizers because these are environmental friendly and they do not have any effect on animals and human



SYNTHESIS OF SOME NEW SCHIFF BASES AND THEIR ANTIMICROBIAL POTENTIAL

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ABSTRACT:

some novel Schiff bases (3a-3d) were synthesized on facile condensation of 1-(1-hydroxynaphthalen-2yl)ethanone with substituted aromatic amines in presence of catalytic amount of acetic acid. The structure of newly synthesized Schiff bases were confirmed on the basis of spectral analysis and screened for antimicrobial potential against some microorganisms. All the synthesized compounds show good to moderate activity.

Keywords: 1-(1-hydroxynaphthalen-2yl)ethanone, Aromatic amine, spectral analysis, Antimicrobial potential.

Introduction:

The Schiff bases constitute one of the most active classes of the compounds possessing diversified biological applications. The Schiff bases have been reported to possess higher degree of antitubercular [1], anticancer [2], antibacterial [3], anti-inflammatory [4], antifungal [5]. Schiff bases belong to a widely used group of organic intermediates used for synthesis of pharmaceutical or rubber [6] additives and amino protective group in organic synthesis [7-10]. The utility of Schiff bases lay in their usefulness as synthons in the synthesis of bioactive molecules such as 4-thiazolidinines, 2-azetidinones, benzoxazines, formazans, they occupy an important role in medicinal chemistry and have been reported to possess antiviral [11-13], antimicrobial [14,15] and anti-inflammatory [16], anticancer [17], anti-HIV [18] activities. By considering wide

range of biological activities of Schiff bases in the present research article we have synthesized some new Schiff bases by conventional technique and all newly synthesized Schiff bases were evaluated for antimicrobial activities.

Materials and methods

All the Chemicals used in the synthesis are used were of laboratory grade. Melting points were determined in an open capillary tube and uncorrected. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ¹H NMR spectra were recorded on a Gemini 300 MHZ instrument in CDCl₃ as solvent and TMS as an internal standard. The mass spectra were recorded on EI-SHIMADZU-GC-MS spectrometer. Elemental analysis was carried out on Carlo-Erba mass analyzer. The purity of products was checked by thin layer chromatography (TLC) on silica-gel.

Reaction:

Scheme: Synthesis of Some new Schiff bases

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A cleaner and convenient approach to Amines: Reduction of Symmetric diimines using NaBH₄

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Abstract

Symmetric diimines have been reduced to their corresponding amines by means of NaBH₄ using MeOH as a solvent at room temperature. The reaction time and yield are 1-1.5 hr and 65-80% respectively. Reduction process is very effective, inexpensive and clean for synthesis of diamines in good yield. The structures of the compounds are supported by FTIR, mass spectrometry, ¹H and ¹³C NMR spectral data.

Keywords: NaBH₄ reduction, symmetric diamines, symmetric diimines, spectral data.

Introduction

Synthesis of amines has received more attention than the preparation of many other functional groups in organic chemistry.¹ With the growing repertoire of biologically relevant nitrogenous molecules, it is the need for efficient synthetic methods to prepare amines as useful intermediates.^{2,3} Due to their interesting physiological activities, secondary amines in particular are extremely important pharmacophore in numerous biologically active compounds, which have greatly been touted in the area of drug discovery.⁴ This field has also spurred intense activity on solid phase synthesis⁵ as well as combinatorial library generation where the secondary amines can be utilized as an important scaffolding for further manipulations.⁶

The reduction of imines is one of the most significant and useful method for preparation of the corresponding amines.⁷ Imines can be effectively reduced to amines by several reducing reagents.^{8,9} Sodium borohydride is a powerful reducing agent and has been employed in the reduction of a range of functional groups.^{10,11} In the present work an effort has been made to reduce some symmetric imines by NaBH₄ which is simple, safe and inexpensive reagent, and reduction can be achieved within 1-1.5 hrs.

Material and Methods

Melting points were determined in an open capillary tube and are uncorrected. The chemicals and solvents were of laboratory grade and were purified. Completion of the reaction was monitored by thin layer chromatography using hexane/ethyl acetate as mobile phase on pre coated sheets of silica gel-G (Merck, Germany) using iodine vapor for detection. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ¹H and ¹³C NMR (70MHz) spectra were recorded in DMSO-d₆ with an Advance spectrometer (Bruker, Germany) at 400-MHz frequency using TMS as an internal standard. The mass spectra were recorded on

EISHIMADZU-GC/MS spectrometer. Elemental analyses were performed on a Perkin-Elmer 240 CHN elemental analyzer.

General procedure for reduction of bis-Schiff bases: Into a 100mL flask 0.01 mole bis-Schiff base (1a-k)¹² and 20mL MeOH were placed in an ice bath and 0.03 mole NaBH₄ was added pinch wise during 10 min. with stirring. After complete addition of NaBH₄, the reaction mixture was further stirred at RT for 1-1.5hr. The progress of the reaction was monitored by TLC. The solid separated on evaporation of solvent was filtered, washed with cold water and recrystallized from ethanol to get 2a-k.

4,4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-ethoxyphenol) (2a): White solid. Yield 80%, m.p.132-135°C; IR: ν/cm^{-1} =3420 cm^{-1} (OH), 3280 cm^{-1} (NH), 2928 cm^{-1} (-CH); ¹H NMR: δ/ppm =1.35(t, 6H, -2CH₃), 1.80 (m, 2H, -CH₂), 2.62 (t, 4H, -NCH₂), 3.80 (s, 4H, -CH₂), 4.10 (q, 4H, -2OCH₂), 4.61 (s, 2H, -2NH), 8.40 (m, 6H, 2Ar-H), δ 10.10 (s, 2H, 2Ar-OH); ¹³C NMR: 18, 29, 46, 50, 65, 118, 120, 130, 136, 150;. Anal Calc.C₂₁H₃₀N₂O₄ (374): C, 67.37; H, 8.02; N, 7.45. Found: C, 67.40; H, 8.31; N, 7.75.

4, 4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-bromo-6-ethoxyphenol) (2b): Faint brown solid. Yield 75%, m.p.127-130°C; IR: ν/cm^{-1} =3445 cm^{-1} (OH), 3320 cm^{-1} (NH), 2980 cm^{-1} (-CH); ¹H NMR: δ/ppm =1.40(t, 6H, -2CH₃), 1.91 (m, 2H, -CH₂), 2.65 (t, 4H, -NCH₂), 3.9 (s, 4H, -CH₂), 4.2 (q, 4H, -2OCH₂), 4.5 (s, 2H, -2NH), 8.6 (m, 4H, 2Ar-H), δ 10.2 (s, 2H, 2Ar-OH); ¹³C NMR: 19, 30, 48, 52, 66, 119, 122, 133, 138, 155;. Anal Calc.C₂₁H₂₈Br₂N₂O₄ (530): C, 47.54; H, 5.28; N, 5.28. Found: C, 47.40; H, 5.31; N, 5.20.

4,4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-ethoxy-6-iodophenol) (2c): White solid. Yield 75%, m.p.129-131°C; IR: ν/cm^{-1} =3443 cm^{-1} (OH), 3305 cm^{-1} (NH), 2965 cm^{-1} (-CH); ¹H NMR: δ/ppm =1.38(t, 6H, -2CH₃), 1.87(m, 2H, -CH₂), 2.70 (t, 4H, -NCH₂), 3.82 (s, 4H, -CH₂), 4.19 (q, 4H, -2OCH₂), 4.20 (s, 2H, -2NH), 8.5 (m, 4H, 2Ar-H), δ 10.14(s, 2H, 2Ar-OH); ¹³C NMR: 19, 31, 48, 52, 65, 119, 120, 134, 137, 158;. Anal Calc.C₂₁H₂₈I₂N₂O₄ (626): C, 40.25; H, 4.47; N, 4.28. Found: C, 40.10; H, 4.25; N, 4.30.

4,4-((propane-1,3-diylbis(azanediyl))bis(methylene))bis(2-methoxyphenol) (2d): White solid. Yield 85%, m.p.110-112°C; IR: ν/cm^{-1} =3428 cm^{-1} (OH), 3280 cm^{-1} (NH), 2943 cm^{-1} (CH); ¹H NMR: δ/ppm =1.72(m, 2H, -CH₂), 2.61(t, 4H, -2CH₂), 3.70 (s, 4H, -2NCH₂), 3.89 (s, 6H, -2OCH₃), 4.60 (s, 2H, -2NH), 8.22 (m, 6H, 2Ar-H), δ 10.05(s, 2H, 2Ar-



SYNTHESIS OF SUBSTITUTED 2-HYDROXYNAPHTHYL ISOXAZOLINE DERIVATIVES AS ANTIBACTERIAL AGENTS

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ABSTRACT

In the present study new series of isoxazolines (3a-3f) were synthesized from 2-hydroxynaphthyl functionalized chalcones and hydroxylamine hydrochloride in 2-ethoxy ethanol. The synthesized isoxazoline were purified by recrystallization and evaluated for antibacterial activity against four pathogenic bacteria, two gram negative and two gram positive. The antibacterial data revealed that electron rich (3f) and halogen disubstituted (3a, 3b, and 3c) isoxazolines showed higher activity against bacterial strain tested. It also revealed that all compounds showed good to moderate activity compared to standard drug.

Keywords: Chalcones, hydroxylamine hydrochloride, isoxazolines, antibacterial activity.

Introduction

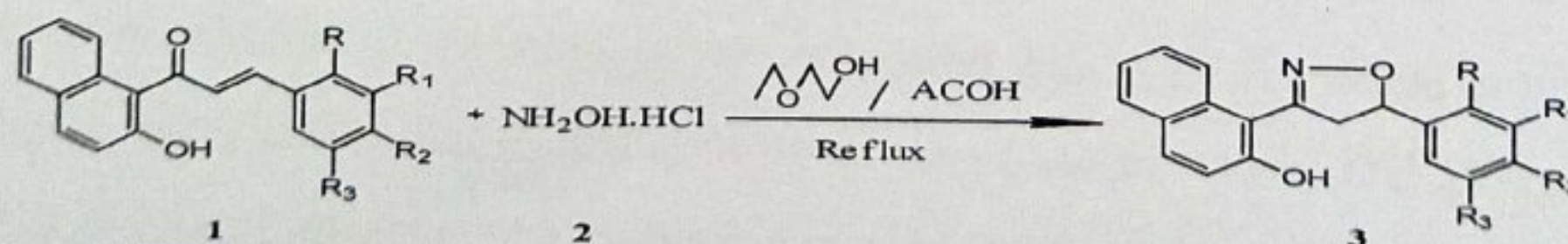
In recent years, millions of people in the region of the world are being suffer either Gram-positive or Gram-negative bacterial strains. The result of these microorganism leads to food poisoning, diarrhoea, salmonellosis, rheumatic etc.[1] Thus, antibiotics are the primary solutions for these microbial infections. However, continuous and overuse of these antibiotics has led to multi-drug resistance of several groups of microorganisms[2]. Furthermore, the existing pharmacological drugs are either too expensive or turn to ineffective or have undesirable side effects[3]. Thus, there is an emergency to develop new antibiotic agents with novel targets for the extension of bacterial aggressions in recent years[4]. Compounds incorporating heterocyclic ring systems continue to attract considerable interest due to the wide range of biological activities they possess [5-9]. Among the wide range of heterocycles that have been explored for developing pharmacologically important molecule is isoxazolines [10-14], which play a significant role in the field of medicinal chemistry.

In addition, isoxazoline derivatives have medicinal activities such as anti-

inflammatory[15], antibacterial[16-18], anticonvulsant [19], antibiotic[20], antitubercular[21], antifungal [22], anxiolytic [23], antidepressant [24], analgesic [25], antioxidant, antituberculosis, anticonvulsant activity [26]. Encouraged by the diverse biological activities of isoxazoline compounds, it prompted us to synthesize new isoxazoline derivatives from 2-hydroxynaphthyl functionalized chalcones and evaluate their antibacterial activity against four pathogenic bacteria.

Material and methods

All the Chemicals used in the synthesis are used were of laboratory grade. Melting points were determined in an open capillary tube and are uncorrected. Purity of compounds and completion of the reaction was monitored by thin layer chromatography using hexane/ethyl acetate (7:3) as the mobile phase on precoated sheets of silica gel-G (Merck, Germany) using iodine vapour for detection. IR spectra were recorded in KBr on a Perkin-Elmer spectrometer. ¹H NMR spectra were recorded on Avance spectrometer (Bruker, Germany) 300 MHz in CDCl₃ using TMS as an internal standard and chemical shifts are reported in δ units and Elemental analysis was performed on Perkin-Elmer 240 CHN elemental analyzer.



Scheme 1. Synthesis of Isoxazolines



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New Flavonols Synthesized from 2-hydroxynaphthyl Chalcones using 2-ethoxy ethanol solvent as as Antibacterial Agents

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Abstract: In this study new series of flavonols (**3a-3j**) were synthesized from 2-hydroxynaphthyl chalcones and hydrogen peroxide by using solvent 2-ethoxy ethanol. The Synthesized flavonols were evaluated for antibacterial activity against four pathogenic bacteria, two gram positive and two gram negative. The antibacterial data showed that electron rich and halogen disubstituted (**3g, 3h, 3i** and **3j**) flavonols exhibit higher antibacterial activity against all bacterial strain tested. It also revealed that all compounds showed good to moderate activity compared to standard drug.

Keywords: Chalcone, Hydrogen peroxide, 2-ethoxy ethanol, Flavonol, Antibacterial activity.

1. Introduction:

Flavonoids are a family of bioactive polyphenolic compounds; they are present in many commonly consumed vegetables, fruits, and other plant-based foods¹. Over 4000 different flavonoids have been described, and they are categorized into flavones, flavonols, flavanones, catechins, isoflavonoids and anthocyanidins. They are widely distributed throughout the plant kingdom and are of importance and interest to a wide variety of physical and biological scientists².

Flavonol is the major representative of the flavonoid subclass; they are the most abundant and broadly distributed in nature and are considered as the most active compound within the flavonoid group. Flavonol have the 3-hydroxyflavone backbone. They differ due to different positions of the phenolic -OH groups. Flavonols such as quercetin, myricetin and kaempferol attract considerable interest due to their diverse biological activities³⁻⁹.

Naturally occurring flavonols and their derivatives show various biological and pharmacological activities such as anticancer¹⁰, antioxidant¹¹, antimicrobial¹², antifungal¹³, anxiolytic¹⁴, Antiulcerogenic¹⁵, cytotoxic¹⁶, and



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Effects of planting methods on growth attributes and yield of paddy (*Oryza sativa* L.)

Jadhav KK, Kashid NV, Shende SM and Lolamwad NS

Abstract

An experiment entitled, "Effects of planting methods on growth and yield of paddy (*Oryza sativa* L.)" was carried out during *Khari*, 2020 at Agricultural Research Station Farm, VadgaonMaval, Tal. Maval, Dist. Pune to investigate effects of planting methods on growth attributes and yield of paddy (*Oryza sativa* L.). The field experiment was laid out in Randomized Block Design (RBD) with three replications. There were eight treatments comprising of different sowing methods of rice viz., T₁-Sowing as direct seeded rice (DSR) at 22.5cm by bullock drawn seed drill, T₂-Sowing as direct seeded rice (DSR) at 30cm by bullock drawn seed drill, T₃-Sowing by dibbling method at 20 x 15 cm², T₄-Direct sowing of rice by tractor operated mechanical seed drill, T₅-Direct sowing of rice by 'Saguna Rice Technique'(SRT), T₆-Direct sowing of rice by 'Modified Direct Seeded Rice Technique'(MDSRT), T₇-University recommended method (Four Point Agro-Technology or Char Sutri Method) and T₈-Farmer's practice-Conventional transplanting method. The periodical observations on growth attributes and yield were recorded to assess the treatment effects. Results revealed that planting methods had significant effects on growth attributes and yield of paddy. The treatment T₆-Direct sowing of rice by 'Modified Direct Seeded Rice Technique' (MDSRT) recorded the maximum height at 14 DAS (22.2 cm), 28 DAS (39.9 cm), 42 DAS (59.9 cm), 56 DAS (69.7 cm), 70 DAS (82.5 cm), 84 DAS (90.0 cm) and at harvest (94.5 cm). Number of tillers m⁻² were significantly more with T₆-Direct sowing of rice by 'Modified Direct Seeded Rice Technique' (MDSRT) than rest of all the planting methods at all growth stages as 42 DAS (127.3), 56 DAS (157.2), 70 DAS (196.5), 84 DAS (218.3) and at harvest (229.8). The grain yield (63.74 q ha⁻¹) and straw yield (68.88 q ha⁻¹) were significantly superior in the treatment T₆-Direct sowing of rice by 'Modified Direct Seeded Rice Technique' (MDSRT) (63.74 q ha⁻¹) than rest of the sowing methods except it was at par with the treatment T₇-University recommended method (Four Point Agro-technology) having grain yield(55.60 q ha⁻¹) and straw yield of paddy (60.10 q ha⁻¹) respectively.

Keywords: planting methods, DSR, MDSRT, paddy, growth attributes and yield

Introduction

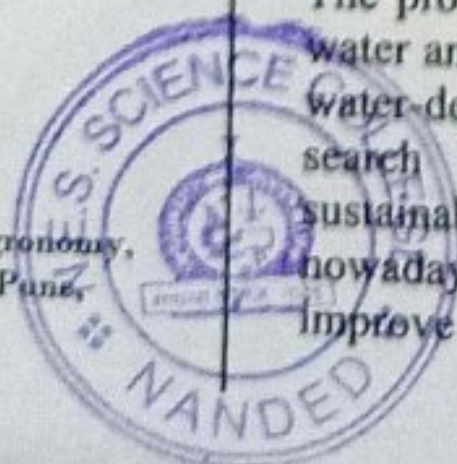
Rice (*Oryza sativa* L.) is one of the most ancient crops being cultivated in 117 countries, hence called as "Global grain". It is the staple cereal food grain of majority of India's over one billion population, contributes to nearly 44 per cent of total food grain production. Rice feeds more people over a longer period of time than any other crop. Rice has been documented in the history books as a source of food and for tradition as well since 2500 B.C. Beginning in China and the surrounding areas, its cultivation spread throughout Sri Lanka and India. Global demand for food is rising because of population growth, increasing affluence and changing dietary habits. The UN/FAO forecasts that global food production will need to increase by over 40 per cent by 2030 and 70 per cent by 2050. Yet globally, water is anticipated to become scarce and there is increasing competition for land, putting added pressure on agricultural production. In addition, climate change will reduce the reliability of food supply through altered weather patterns and increased pressure from pests and diseases. Rice along with wheat form the bedrock of Indian food security and to meet the country's stated goal of ensuring food for all, farmer will have to produce more rice from lesser land, using less water, energy and other inputs and keeping in harmony with the fragile environment.

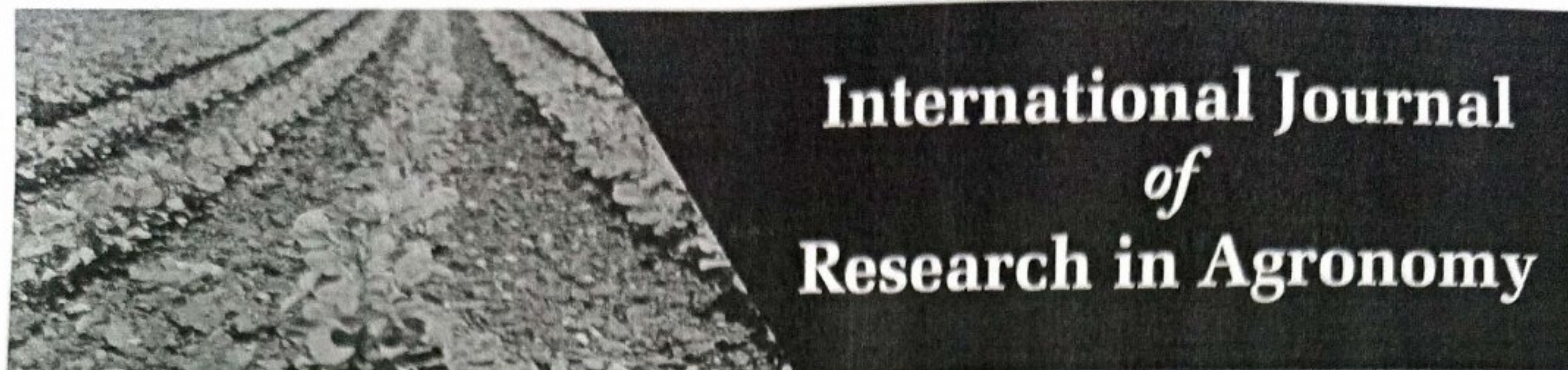
The production of conventional puddle transplanted rice faces severe constraints because of water and labour scarcity and climatic changes (Pathak *et al.*, 2011)⁽⁹⁾. Imminent water crisis, water-demanding nature of traditionally cultivated rice and climbing labour costs rattle the search for alternative management methods to increase water productivity, system sustainability and profitability. Direct seeded rice (DSR) technique is becoming popular nowadays because of its low-input demanding nature. It offers a very exciting opportunity to improve water and environmental sustainability.

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Effects of planting methods on yield attributes and yield of paddy (*Oryza sativa* L.)

Jadhav KK, Kashid NV, Avte SB and Halge SS

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Abstract

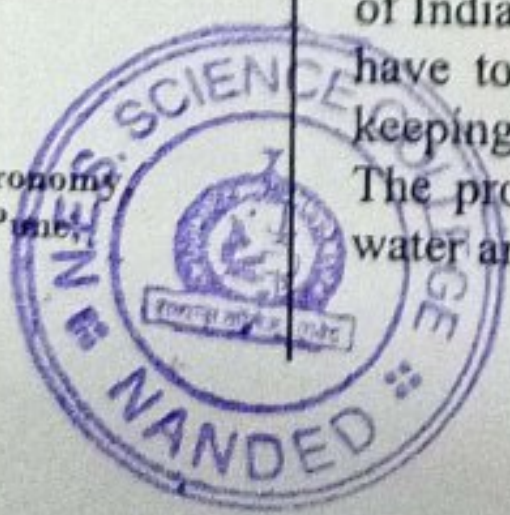
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Keywords: Planting methods, DSR, MDSRT, paddy, yield attributes and yield

Introduction

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The production of conventional puddle transplanted rice faces severe constraints because of water and labour scarcity and climatic changes (Pathak *et al.*, 2011)^[9].

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Plastic Waste Management and Disposal Techniques in Rural Areas of Basmath Tehsil, MS, India

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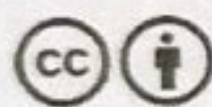
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Abstract


We are living in a plastic age. For most of us, life without plastics is unthinkable. However, in recent years the littering of plastics and the problems related to their persistence in the environment has become a major focus in research and. Once plastic is discarded after its utility is over, it is known as plastic waste. It is a fact that plastic waste never degrades, and remains for several years. Mostly, plastic waste is recyclable but recycled products are more harmful to the environment as this contains additives and hazardous chemicals. The study concluded that most of the rural households are still using traditional methods of managing plastic waste, even though recommended plastic waste management practices such as reusing and recycling were found amongst some households in Kautha.

Keywords: Plastic waste, Waste generation Management practices, Rural households, Basmath, Kurunda.

1. Introduction

Waste is a global issue. If not properly dealt with, waste poses a threat to public health and the environment. It is a growing issue linked directly to the way society produces and consumes [1]. It concerns everyone. Waste management is a basic human need and can also be regarded as a 'basic human right'. Plastics are a sub-species of a class of materials known as polymers [2]. The word 'plastic' originates from a Greek word 'plasticos', which means 'it can be shaped'. There has been a steady increase in the use of plastic products, resulting in rise in




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Status of Micronutrients in Soils of Nanded District, Maharashtra, India.

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Abstract:

Soil fertility determines crop growth productivity and consequently affects quality and sustainability. Micronutrients are essential for plant growth and development but it is needed in very small quantities in the plant system. Significance of micronutrient is unavoidable since plant relies primarily on micronutrient as it has profound influence on various plant activities. Although micronutrients are abundantly present in the soil but plants usually acquire them in relatively trace amounts, therefore known as tracer element. It includes Cu, Fe, Mn, Zn, S and B. In present study, soil samples collected from different locations and analysed for their micro nutrients. The evaluation of micronutrients analysis shows that most of soil parameter are not fulfilled to desired level and found to low fertility. Hence it is suggested that soil samples must be enriched with nutrient by organic manure or chemical fertilizers treatment to acquire optimum nutritional needs.

Keywords: Micronutrients, agriculture, soil, chemical fertilizers.

Introduction:

Soil may be defined as, “the natural medium for the growth of land plants on the surface of the earth composed of organic and mineral materials” [1]. Plant nutrition management in commercial crops through the application of macro and micronutrients is essential not only for achieving high yields but also for fulfilling market requirements for high quality end-products [2]. Common nutrition practices focus on the application of macronutrients through synthetic fertilizers without considering micronutrients [3]. In addition, it is not uncommon the irrational use of excessive fertilizer rates which may result in soil and/or ground water contamination and phytotoxicity. Population growth and living standards have increased requirements for food supply, and as a result, farmers are encouraged to intensive crop cultivation. Using the same soil continuously for the cultivation of the same crops causes nutrient depletion [4].

The optimal contents of macro and micronutrients in agricultural soil determine crop growth, quality, and productivity. The growth and development process of the plants require the optimal amount of Nitrogen as an irreplaceable nutrient, while Phosphorus, Carbon, Sulphur, Calcium, Potassium, and Magnesium also play roles in the same process [5]. Eight elements are known as micronutrients; namely B, Cl, Fe, Mn, Ni, Cu, Mo, and Zn, and maintain the ecosystem, quality, and yield of crop production. The Nanded region is characterized by intensive agricultural cultivation. There have been no previous studies on the contents and distribution of micronutrients in agricultural soils. The objectives of this study were analysis of micronutrient contents, fertility evaluation based on micronutrient contents.



Physico-Chemical Study of Farmland Soil Samples in Nanded Region of Marathwada

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Abstract:

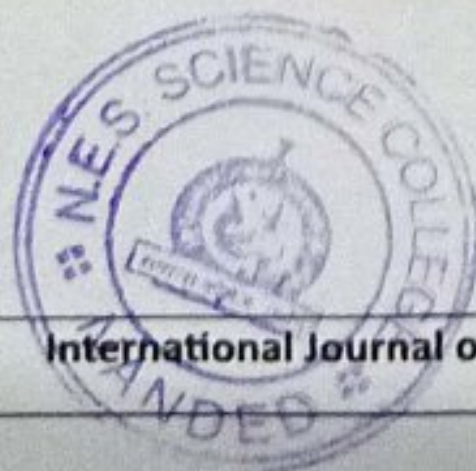
All fundamental needs of human beings and other living organisms are fulfilled by soil. It is one of the most important resources of universe. Interest in soil chemistry developed due to its unique property to produce and sustain crops. Soil takes eminent position in cultivation of crops. The physical and chemical properties of soil are very important to understand because soil productivity depends upon these factors. This, physico-chemical study of soil is based on various parameters like pH, electrical conductivity, moisture, texture, temperature, organic matter, nitrogen, phosphorus and potassium contents of soil.

Keywords: Soil, physicochemical, nutrients, electrical conductivity.

Introduction:

Soil acts as a key element for food production on which life sustains on this earth. Soil ecosystem provides various functional services, such as maintenance of soil fertility, promoting ecosystem stability, and regulating climate change [1]. It is well recognized that anthropogenic disturbances like excess use of chemical fertilizers greatly affect soil physical and chemical properties, and biochemical activities. The term soil has been originated from "solum" a Latin word meaning the earthy material in which plant growth occurs [2-3]. Soil is a complex matter and comprises minerals, soil organic matter, water, and air. These factors greatly influence soil texture, structure, and porosity [4]. These properties subsequently affect air and water movement in the soil layers, and thus the soil's ability to function. Therefore, soil physicochemical properties have a great influence on the soil quality. Soil testing provides information regarding nutrient availability in soils which forms the basis for the fertilizer recommendations for maximizing crop yields [5]. Soil fertility map for a particular area can prove highly beneficial in guiding the farmers, manufacturers in ascertaining the requirement of various fertilizers in a season and making projections for increased requirement based on cropping pattern [6].

Furthermore, the procedure used in the present work can be applied in many areas that are similar characteristic with the study area of the present work. The objective of the present work is to analysis and discusses the suitability of soil for urban development and to find its environmental impact on Nanded district.



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Yield and Correlation with Weather Parameters as affected by Transplanting Time and different Varieties of Paddy (*Oryza sativa* L.)

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ABSTRACT: The most critical element impacting crop yield is when it is planted. The performance of a variety is totally dependent on when it is planted. The research of crop for transplanting time and different varieties in relation to meteorological conditions is very important for attaining increased paddy yield. The length of the panicle (22.3 cm), number of spikelets panicle⁻¹ (14), number of grain panicle⁻¹ (180), grain weight panicle⁻¹ (4.04 g), test weight (22.20 g), grain yield (52.90 q ha⁻¹) and straw yield (62.27 q ha⁻¹) of Kharif paddy were all improved by transplanting during the 28th MW. VDN-99-29 (Phule Samruddhi) had significantly higher yield attributing characters such as panicle length (23cm), number of spikelets panicle⁻¹ (15), number of grain panicle⁻¹ (189), grain weight panicle⁻¹ (4.23 g), test weight (22.31 g), grain yield (53.55 q ha⁻¹), grain yield (53.55 q ha⁻¹), grain yield (53.55 q ha⁻¹) and straw yield (53.55 (61.02 q ha⁻¹). Interactions between paddy kinds and transplanting time had a significant impact on yield characteristics. When the VDN-99-29 (Phule Samruddhi) paddy variety was transplanted during the 28th MW, it had a significant effect on panicle length (23.9 cm), number of spikelets panicle⁻¹ (19), number of grain panicle⁻¹ (225), grain weight panicle⁻¹ (5.25 g), test weight (23.50 g), grain yield (66.20 q ha⁻¹), and straw yield (76.35 q ha⁻¹). When compared to the T_{max}, or maximum temperature, bright sun hour, and growing degree days (GDD) during the crop growing period showed significant and negative correlation with yield and yield attributing characters, whereas T_{min}, or minimum temperature, RH-I and RH-II during the crop growing period showed significant and positive correlation with yield and yield attributing characters.

Keywords: transplanting time, paddy varieties, weather parameters, yield attributing characters, yield, and correlation.

INTRODUCTION

Paddy has been the staple meal for more than 60% of the world's population, supplying energy to around 40% of the world's population, and every third person on the planet consumes rice on a daily basis in some form or another (Virdia and Mehta, 2009). As a result, crop paddy (*Oryza sativa* L.) is a widely produced crop in tropical and subtropical locations around the world. Higher population growth, increasing affluence and changing dietary habits leads to increased global food demand. The United Nations/Food & Agricultural Organization predicts that world food production will need to rise by over 40% and 70% by 2030 & 2050, respectively. Yet globally, water is anticipated to become scarce and there is increasing competition for land, putting added pressure on agricultural output. Besides, climate change will affect the reliability of the food supply through different changed weather

patterns and increased damages due to pests and diseases. The worldwide paddy production was 503.17 in 2020-21 million metric tonnes; China was the leading country with a production of 148.30 million metric tonnes followed by India with 120.00 million metric tonnes (Anonymous, 2021).

Rice is a basic food crop that is grown all over the world. A number of researchers from India and elsewhere have studied the impact of transplanting time and sowing date on rice crop development and productivity. The rice crop's transplanting and sowing times had a major effect over three seasons. For starters, it guarantees that vegetative development occurs during a period of appropriate temperatures and total sunlight hours. Second, when the minimum night temperatures are historically the warmest, as indicated by the appropriate transplanting and sowing times for each cultivar, the cold-sensitive phase begins. Finally, early transplanting and seeding ensures that grain filling



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Multimodal Web Content Mining to Filter Non-learning Sites Using NLP

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Abstract. Today Internet is a rapidly growing field and it has become one of the huge sources of data. Internet plays a vital role in the educational field. Every student is using e-learning technology over internet to enhance their knowledge. Web mining is one of the data mining branch which helps user to filter and extract relevant data from web and avoid the hitting of the irritating sites. In this paper we have proposed an algorithm of filtering tool which can recognize and block all non learning sites by matching the multiple patterns like text, video and images of the web pages by web content mining. Html document of web page is processed using Natural Language Processing (NLP) and Word Sense Disambiguation (WSD) for recognizing the web content of learning sites.

Keywords: Web mining · Web content mining · NLP · WSD · Data mining

1 Introduction

Today our life is totally dependent on internet, through which we are getting lots of information in a single click. We can do several routine tasks from our remote place. The tasks like air/bus/train ticket reservation, purchasing all type of daily needs, bank transaction, business, marketing, education etc. can be carried out easily by using internet.

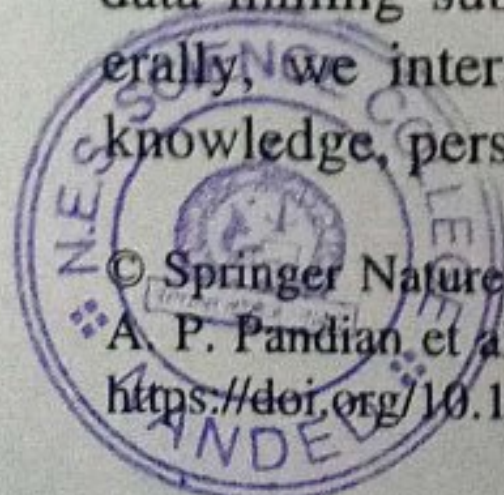
E-learning is one of the rapidly growing fields over the internet. Using these internet facilities students can enroll for different job oriented online courses, approach to different companies for placements, and also prepare for interview by taking the guidance from experts, online. While surfing the internet, searching for such online services, Google search engine provides number of links which are unrelated to the desired topic. This makes the searching process, time consuming. To overcome this problem we need to develop one tool, which can easily recognize the desired learning sites and reduce the unnecessary site hits. Such tools are useful for students, professionals, and teachers to achieve their desired goal.

There are billions of web sites coming into the focus every year. It is very difficult to recognize only specific sites by their name or structure. So web mining is one of the data mining sub application which is important to develop personalized tools. Generally, we interact with the web for finding relevant information, discovering new knowledge, personalized web page synthesis, and learning about individual users. Web

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Web Content Filtration Using Different Web Mining Techniques in Educational System: An Overview

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Abstract— Internet is widely used as ICT tool in today's education. The web content filtering is essential tool used to filter offensive, unwanted web content from web pages. Internet is widely used in educational organisations as an ICT tool. To protect our tech savvy student from accessing adult sites, offensive, unwanted data in absence of teachers and parents in school as well as home. A strong filter is required to prevent this type of unsolicited activity. In this paper we review the existing filter tools and their techniques.

Keywords— Data mining, Web mining, ICT, web content filter, tech savvy, offensive.

I. INTRODUCTION

A website filter is a network application used for website control and or to manage traffic. Website filters are used as a tool and security features to block network traffic according to a user or network preferences. Website filters are built into devices or software including router, switches, firewalls, anti-spyware software, and browsers. Web filters are the tools, designed using web mining technique. Web mining is an application of data mining.

ICT is an umbrella term that includes any communication device or application, encompassing: radio, television, cellular phones, computers, and internet etc. To improve quality of teaching and learning we are using Information communication technology (ICT) is used to enhance the learning process. While surfing on internet, web Filter is used to filter unwanted data, inappropriate content across the web, and at the same time allowing students to use rich educational sites to enhance their learning as well as knowledge. Technology has brought more computing to schools, and so that, it need to protect students from inappropriate content across the web. Instead of blocking off large portions of the Internet, many schools are utilizing customizable web filtering systems that allow to control over which sites are allowed or blocked. the Child Pornography Prevention Act of 1996 (CPPA), the Children's Online Privacy Protection Act of 1998 (COPPA) and the Children Internet protection Act (CIPA) requires that schools have to protect students from obscene or harmful online content in order to be eligible for discounts on internet access or internal connections through the Schools and Libraries.

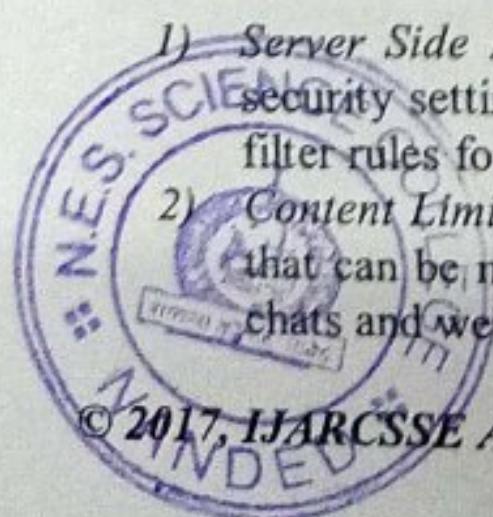
II. THE PROBLEM IN EDUCATIONAL ORGANIZATION

Most educational sites are AdSense enabled for their revenue. Websites displays advertisements which contain all types of products. When any child accesses e-learning sites, automatically advertises or offensive contents are displayed in the form of image or videos on the web pages. This may divert the learner's attention to any e-commerce or offensive sites. This is one of the increasing problems for parents and teachers in today's world. The government is urging to educational institutes to use information communication technology (ICT) tools for teaching and learning process. So, parents and guardians require internet with parental control. There are purposely built filters that analyses each page for inappropriate content before deciding whether it's suitable for the user or not. If so, the request is blocked and the user is sent back to a safe location. Introducing these tools at home and educational organization would be the simple answer to prevent access to adult content. It allows parents to keep control over their child's web access.

Educational organization try to facilitate good infrastructure in respect to information technology with Wi-Fi enabled campus. Students are also able to access social, adult content sites at the class or at home. But without web filtering it is difficult to manage the login from improper content to the students and other related member. So web filtering is prime factor in ICT education.

III. TYPES OF WEB CONTENT FILTERING

- 1) **Server Side Filter:** In this content filtering software is installed on a central server which can monitor the security settings on all the other systems on the same network. The network administrator can apply the same filter rules for all computers which are connected to server.
- 2) **Content Limited ISP:** In this filter, the internet service provider has the authority to regulate the types of pages that can be not content any unwanted data for the users. It logs, blocks malicious websites, monitors emails, chats and web traffic to prevent Denial of Service (DoS).





A Role of Semantic Web and Ontology in Information Retrieval

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ABSTRACT

Web Mining is an application of data mining which focuses on discovering relevant data from Web content. The Semantic Web describes a web as data rather than documents. It characterizes information in understandable manner more implicitly for humans and computers. It was developed with the help of Ontology, which is the pillar of the Semantic Web. The semantic Web depends on integration and use of semantic data, and semantic data is depends on ontology. Ontology can provide a common vocabulary, a grammar for publishing data, and can supply a semantic d data which can be used to preserve the Ontologies and keep them ready for inference. This also helps in personalized filtering mechanisms for users to consume relevant, interesting information from web sites. By combining web mining and semantic web, we can retrieve relevant data called as semantic web mining. This paper gives an overview of semantic web mining and their applications.

Keywords: semantic web, ontology, semantic web mining, personalization.

I. INTRODUCTION

Data Mining (DM)(knowledge Discovery in databases) is the process of extraction of required pattern or information from large databases using various data mining techniques such as classification, clustering, association rule etc. which helps in various decision making. The web mining is the application of data mining through which we can extract the relevant data from web pages.[1]

The online web portals for e-learning, e-government and e-commerce became a very common part of Web. In that e-learning is one of the immerging web portal through which student can learn anywhere any time. Now a days ICT(information communication technology) plays an vital role to convert traditional education system into modern education system. Internet is one of the ICT tool which is a knowledge warehouse. Students are using different educational sites for updating knowledge, learning new technologies, enrolling different courses for their academic growth.

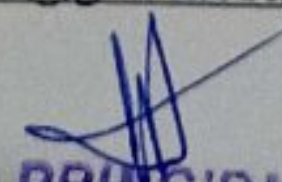
But while surfing on web student spending lot of time to obtain relevant web sites and data. Web mining is one of the application through which we can retrieve required educational information.

1. Web Data Mining

The Web is the largest publicly accessible data source in the world. The Web has many unique characteristics, like mining useful information and knowledge, fascinating and challenging the different task. The information on the Web is noisy. The noise comes from two main sources. First, a typical Web page contains many pieces of information, e.g., the main content of the page, navigation links, advertisements, copyright notices, privacy policies, etc. For a particular application, only part of the information is useful. The rest is considered noise. To perform fine-grained Web information analysis and data mining, the noise should be removed. Second, due to the fact that the Web does not have quality control of information, i.e., one can write almost anything that one likes, a large amount of information on the Web is of low quality, incorrect, or even confusing.

Web mining is divides into three types.




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Browser Integrated Web Content Filtering Using Natural Language Processing

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Abstract: Today internet is one of the rapid growing ICT technologies which are used in every field like business, marketing, banking, entertainment, transporting and education etc. over the world. E-learning technology is playing a vital role in modern education which facilitates the student to learn anywhere, anytime, with their own speed and technology. So that, Internet filtering and blocking is very important for a couple of reasons. With the flooding of explicit and violent materials on the Web, educators and parents would like to block these offensive materials from their children. In this paper we proposed a browser integrated client side filter using natural language processing. The web content filtering is used on browser integrated extension which helps to keep children away from accessing offensive contents and encourages to safe e-learning. This filter performs web page text content mining to create keyword database of 2000 e-learning web sites which are collected by survey method. Extracted text from web page used as knowledge base to block the non learning sites in the educational organisation.

Keywords: web filter, ICT, e-learning, Natural language processing, web mining, browser, extension.

I. INTRODUCTION

The Internet has rapidly made a great impact on the world. With development of the www, Internet surfing has become an important daily activity for the people in general. Internet is used in communication, buying and selling of product online, travel booking, route tracking, online medical diagnostic center, entertainment, news sites, online education training centers, etc.

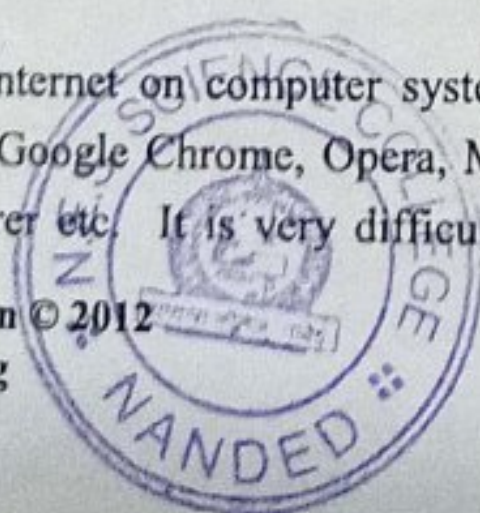
Education is one of the fields, which is growing swiftly. E-learning means electronic learning which is a novel concept that enables students to take their education anytime, anywhere, with their own speed and technology. These e-learning sites run different subject courses to improve knowledge of students by sitting at home or in school. Any student can avail this service on paid or on free basis. While using internet there is no restriction for the student in accessing the web content. Student may also try to access harmful data in the absence of parents at home or in the absence of teacher at school and colleges. So web filter plays an important role to block irrelevant websites. There are different web filters present in different forms in the computer system, which helps to monitor the student's data accessing habits and try to block harmful sites. There are billions of websites that contain obscene and malicious information.

To access internet on computer system, users always used browsers like Google Chrome, Opera, Mozilla Firefox, Safari, Internet explorer etc. It is very difficult to restrict user from

accessing unwanted sites at browser level. At browser level we can only use extension, plug-in, add-ons, and web application, which help to block unrelated web content. Different browser extension are used to block ads and adult contents, web data scraping, YouTube ads block etc. But no browser extension is found that restricts the student from browsing irrelevant sites. In our proposed work third party application i.e. browser extension is used to restrict the student in education organization from accessing non e-learning sites. Proposed Extension allows the student to access only e-learning sites.

II. E-LEARNING AND ICT TOOLS

In modern education system with the help of computer we can easily teach the concepts of science, mathematics, geography, economics, history, civics etc. The teacher communicates with students through computer tools which are known as information communication technology. To communicate with the student we use hardware as well as software tools. The hardware like keyboard, mouse, monitor, scanner, printer, speaker, microphones, projector, etc. are ICT tools used to enhance teaching and learning process. Also application like email, internet, MS Office, Adobe Reader, paintbrush, Geogebra, Selenium, etc. are used as ICT tools. The internet is one of the data warehouse through which student can access number of sites to acquire knowledge.



A Keyword Based Educational and Non-Educational Website Recognition Tool

Sangita Modi, Sudhir B. Jagtap

Abstract: Today we all depend upon internet to do our daily activities. For booking hotel, air tickets, finding particular places, travelling, cooking, education, banking, etc. we require internet. To get a specific thing immediately, we require filtering tools. E-learning is a new and rapidly growing media in modern education system, which is totally based upon internet. While surfing on internet students may get distracted from offensive and irrelevant websites. In avoiding such distractions, filters play a vital role. This paper proposes a filter tool which carries out web scraping of text data, data cleaning, Natural language processing and filtering the non-learning sites in real-time. We have collected the text from paragraphs, images and video tags. This extracted textual data is in the form of sentences, which are processed part of speech (POS) by NLP. In NLP we are using WSD method to find the exact meaning of the ambiguous words in that context. This tool creates a knowledge base of student related sites using NLP and SVM classification technique. Word sense disambiguation is used to find the correct senses of those words, in the present sentence, which may have multiple meanings. We have created a keyword database of all learning sites. Lastly, we are classifying the sites in two categories learning and non-learning using Support Vector Machine in this tool.

Keywords: E-learning, NLP, web content mining, SVM, POS, WSD.

I. INTRODUCTION

In today's internet era, it is very difficult to stop students from accessing unwanted data. Students always access academic or non-academic information from internet. E-learning is one of the novel approach introduced using internet. This is one of the modern education systems which has many pros and cons. Advantage is that anyone can enroll in these online courses from absolutely anywhere. But the major disadvantage is that, students may get distracted from their studies very easily while surfing on the internet. The search engine "Google" always displays a list of related and unrelated websites in its search result. Students spend a lot of time on internet to search relevant data from educational sites. It is very difficult for them to classify the listed web sites as learning or non learning.

Today, website classification is one of the challenging tasks because; so many types of websites are coming into center of attention every year. Accessing unwanted web site is also one of the major issues arising in this era. The parental control tools are helpful for guardians and teachers to restrict students from accessing unwanted and offensive type of web sites. Browsers like Chrome, Firefox, Opera, etc. are using web site blocker extensions and plug-in and some desktop applications to block unwanted websites. Here to block

offensive websites you have to give the web site's names and their keywords manually. But if any students are trying to access the website which is not present in the list, then such tools fail to block the unknown website.

Web content mining [1] is the web mining [2] technique through which we propose a filter tool which can be used to recognize the sites as learning or non learning.

A. Web content mining

Web Content Mining (WCM) is sub type of web mining used to extract the web content. Web page contains images, videos, text, banners, ads and many more things. Extraction of all type of patterns is very difficult and challenging process. In the web page source there are number of tags of HTML language. From that only text data extraction is one of the difficult tasks. Some of the web pages are not allowing such type of extraction.

After the source code reading data cleaning is essential thing through which we can get only text data by removing all tags and spaces using regular expression. Web Content Mining uses primary data of the web page. The web page content is always in unstructured form. WCM is used to identify or retrieve useful information from the structured and unstructured data. The structured data like tables, unstructured data like text and semi structured data like html document is used in web content mining. Web Content Mining is one of the difficult task, when we are processing simultaneously on the above three types of data. Web data extractor is used to extract the web content.

B. Natural Language processing

The Natural Language Processing (NLP) [15] plays a vital role in text data processing. The unstructured data like textual data is converted into structured form using features like Word occurrence, Stop Words, Latent Semantic Indexing (LSI), Stemming, N-Grams, Part of Speech, Positional Collocations, and Word Sense Disambiguation. NLP parses relatively well-formed text and sentences in different languages. Each word has at least 11 senses as nouns, 42 senses as verb. The Part-Of-Speech (POS) is used to assign the tag to each word in supervised or unsupervised manner. The WordNet is an English dictionary and associated lexical network which is used in POS tagging process.

Word Sense Disambiguation (WSD) [15] is initiated after POS tagging is completed, which is used to resolve the ambiguity of the words. WSD method is used to find the correct sense of the word, in which context it is present.

In this paper we proposed a framework which is used to identify the learning sites. The WCM is used to extract all the textual data from the HTML document.

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Keyword Based Web Filtering Tool For E-Learning Sites

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Abstract— The internet overwhelms us with huge amount of widely extended, well integrated, rich and dynamic hypertext information. It has deeply influenced our lives and daily routine. Billions of websites contains learning related and unrelated contents. It is very difficult to find and maintain the unrelated urls dataset to stop student from accessing the irrelevant sites in browser. Web content filtering is one of the essential tool which helps to filter out unwanted content. The proposed algorithm used to create strong keyword database of learning sites. This database used along with browser extension to analyze every incoming site and then allows browser to display only learning sites. In this extension natural language processing (NLP) plays an important role to find out and block non learning sites. We have measured the accuracy of the tool using precision and recall.

Keywords—Internet, Techno-Savvy, WWW, Web Mining, Filter, NLP.

I. INTRODUCTION

In the age of internet, all type of information is available at the tip of your finger. Internet is the one of the leading technology which has become the fundamental need of every field. The education system of every county has been converted into modern education system which is pedagogical. Pedagogical means that it is a student centric education system. This system gives the importance to the feelings, opinions, interest, and learning capacity of student. This promotes student to learn anywhere, anytime, with his/her own grasping capacity. Because of internet it is possible for students to take distance education by staying at home. Information and Communication Technology (ICT) [1] is source of universal access to education, fairness in education, the availability of quality learning and teaching. ICT helps to build modern education system. It helps student to understand every concept of subject practically.

In India ICT is also introduced in all universities, colleges and schools to enhance quality of education. In that internet is one of the ICT tools which have many advantages and disadvantages. Through Internet every day students are accessing number of unwanted web sites knowingly or unknowingly. To avoid this number of filter tools are available in the market to block particular category of urls. Web filters are working on data mining [2] application called as web mining [3].

In our proposed work we have created keyword knowledge base of learning sites. Preprocessing has been

done on dynamically collected web page text data using web content mining to form learning site keyword knowledge base (KKB). We have linked this KKB to the proposed browser extension to block non learning sites using natural language processing.

Our approach on web content mining, filtering and blocking will provide full-fledged dataset which will cover as much as possible keywords of unwanted sites of all categories. If this tool is to be made for college campus then, keywords based filtering can block unwanted sites. This will restrict students from taking undue advantage of high speed network to download videos, movies and also accessing social networking sites. When this tool is used, then there will be no need of urls blocking software.

In this paper section I contains introduction of proposed algorithm of keyword knowledge base creation, section II contains related work in which literature review carried out. In Section III we described methodology and step by step process of proposed system. While in Section IV, result analysis of the proposed browser extension is discussed. In the last section V we conclude the proposed system with its significance.

II. RELATED WORK

According to Cohen Almagor, the tools of client side filtering are familiar because they are straightforward to execute and provide guardians and parent a simple way to offer a protective surrounding of internet. A similar personal



Development of High-Performance Supercapacitor using Faceted ZIF-67 MOF Synthesized by Facile Chemical Route

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Abstract. Supercapacitors with meritorious characteristics like high-power density and long cyclic stability have recently grabbed wide research attention. Between traditional capacitors and rechargeable batteries, supercapacitors represent a new type of energy storage device. ZIF-67 Metal-organic framework synthesized simply by facile chemical route. The ZIF-67 MOF was characterized using X-ray Diffraction, UV-visible spectroscopy, Fourier-transform Infrared Spectroscopy, and Atomic Force Microscopy. The present investigations deal with the electrochemical (CV, EIS, GCD) performance of fabricated ZIF-67 electrodes in 2 M, 4 M, and 6 M KOH electrolyte solutions in the potential window of 0 - 0.5 V. The electrode shows efficient results in 6 M KOH with a specific capacitance value of 164 Fg⁻¹ at a scan rate of 10 mVs⁻¹ compared to 72 Fg⁻¹ and 99.8 Fg⁻¹ for 2 M and 4 M, respectively. The ZIF-67 MOF electrodes show up to 95% retention over the 500 repeated charge-discharge cycles. This method facilitates a simple approach to the synthesis of ZIF-67 MOF and its applicability as an energy device.

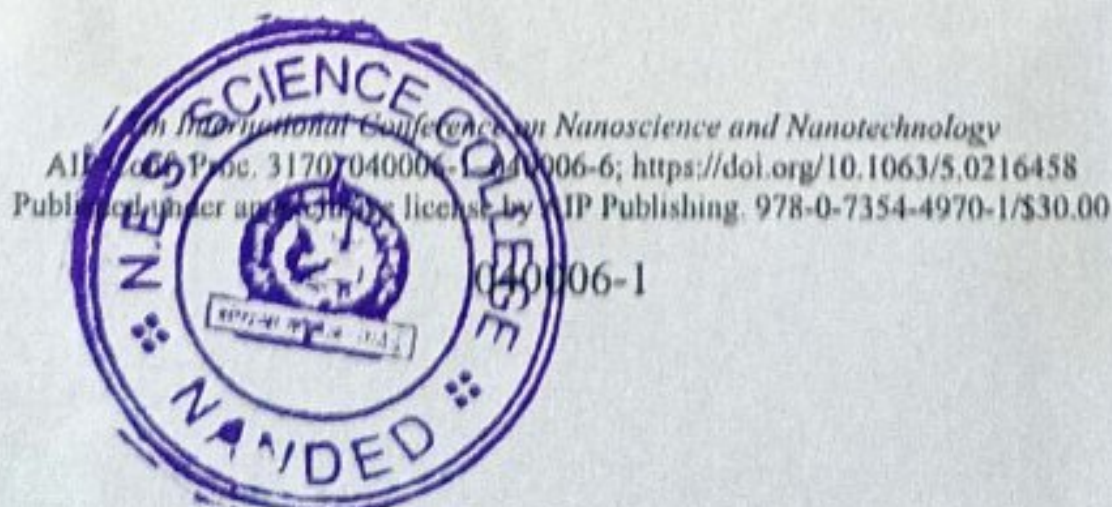
INTRODUCTION

The tremendous demand for energy generation and storage are crucial issues for materials scientists. Among all reported energy storage devices, a device capable of a fast-charging rate with high power and energy density is an interest of study. The supercapacitor is a futuristic device due to its high specific Capacitance, Repeatability, High energy, and power density [1]. Electrical double-layer capacitors (EDLCs) and pseudocapacitors are two different categories of supercapacitors that can be categorized based on how they store energy. The EDLCs provide a long cycle life and high power density by storing charges through the adsorption of ions at the electrolyte and electrode interaction. [2]. However, the energy density of EDLCs is relatively low in organic or electrolyte solutions.

In contrast, pseudocapacitors have around 10 times high energy densities and specific capacitance of EDLCs and store charges using fast reversible Faradaic processes. The pseudocapacitor may have poor cyclic stability as a result of the ongoing redox processes, which might alter the morphology of the electrode materials. So, the key to developing superior-grade supercapacitors is to utilize a novel class of elevated particular surface area and electrode materials with oxidation-reduction sites [3]. Metal-organic frameworks (MOFs), a newly formed grade of materials with distinct structures and meritorious properties, have tremendous attention for wide applications in areas like gas storage, magnetism, catalysis, and solar cells [4].

The materials derived from MOFs demonstrate exclusive porosity, highly controllable structures, large surface areas, excellent conductivity, and electrochemical reliability. Such characteristics make it possible for the materials to fulfill the requirements of high-performance energy storage applications and the long-term cyclic performance of both pseudocapacitors and EDLCs. Till now, hundreds of MOF materials have been discovered, and the count is still rising.; some commonly used MOFs include MIL-101, ZIF-8, ZIF-67, and MOF-74. This is part of the reason why MOFs have been considered prototype materials for the template-like amalgamation of Pseudocapacitors and other such metal-containing substances for electrode material for supercapacitors [5]. Even so, MOFs continue to face challenges due to their elaborate synthesis procedures, expensive precursors, and unstable structure in highly corrosive electrolytes, and also the fact that the majority of MOFs exhibit poor electrical conducting properties due to their direct applications as electrode materials in supercapacitors have been mostly limited [6].

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In-detailed Investigation of Fe₃O₄ Powder Derived from Waste Toner Material for Supercapacitor Electrode Application

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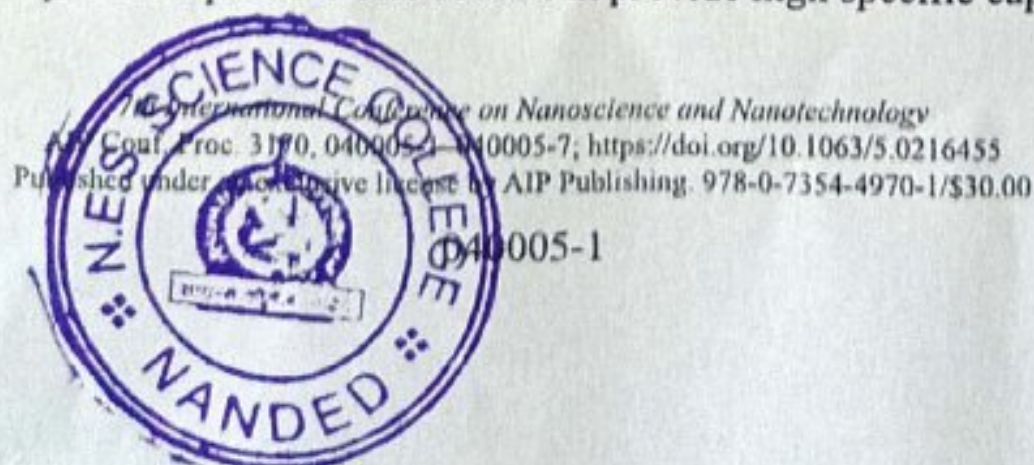
Abstract. In the present investigations, we exhibit the efficacy of Fe₃O₄ as a supercapacitor electrode material. The working material Fe₃O₄ was acquired via recovering waste toner material from printers, followed by an annealing process and magnetic separation a few times to obtain the final product as Fe₃O₄. The obtained material is used in an electroactive manner and then deposited on a Ni-foam substrate to develop a supercapacitor electrode. A range of characterizations characterized the prepared electrodes' physicochemical characteristics and electrochemical investigations. Herewith, we have investigated the molarity effect of KOH electrolyte on the fabricated electrode. The specific capacitance of the electrode was found to be 363 F/g at 10 mV/s within the wide potential window of 1.4 V. Additionally, the electrochemical cyclic stability of the Fe₃O₄ electrode occurred to be 98 % after 1000 cycles. This shows recycled Fe₃O₄ still possesses good properties as electrode material for supercapacitor applications and may encourage repurposing waste toner to restrain electronic trash.

INTRODUCTION

Printers and cartridges are a substantial source of e-waste. Large amounts of toner cartridges that contain chemical resins, metal oxides, plastics, as well as residual toner powder are disposed of in landfill sites around the world, therefore, depleting the quantities of precious metals and recyclable parts, leading to an overall reduction of resources and may also cause respiratory issues in the surrounding areas in the form of dust particles arising from the discharge of toner material [1]. Therefore, closing this loop and establishing a circular economy is necessary by utilizing the recovered waste materials in other applications such as energy storage devices.

An ideal energy storage device should have high energy density while keeping high power density. Supercapacitors show potential as their high-power density than conventional batteries and high energy density than existing capacitors while offering a long-life cycle [2]. Supercapacitors consist of two porous electrodes that are immersed in an electrolyte, and an electric field is generated between the electrodes and the electrolyte in which energy is stored [3]. The electrode material is a composite of powders consisting of particles of active material with conductive carbons and a polymer binder to hold them together on a current collector. An electrolyte is a substance that provides ionic conductivity between the anodic (*Negative*) and cathode (*Positive*) electrodes of a cell. Based on electrode material and energy storage mechanism, supercapacitors are divided into (A) electric double layer (EDLC), which uses carbon-based electrodes, and charge storage takes place at the interface between electrode and electrolyte. (B) pseudocapacitors utilize transitional metal oxides as electrodes in which pseudocapacitance results from fast and reversible faradaic surface redox reactions and some ion intercalation reactions for charge-storing mechanisms. Unlike EDLCs, transitional metal oxide-based pseudocapacitive electrodes can provide high specific capacitance [5-8].


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Investigation of possible effects of electrolyte molarity on Ni-based MOF as an electrode material for highly efficient supercapacitors

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Abstract. Supercapacitors are promising electronic devices for future generations due to their outstanding capacitance, comparatively high energy, and power density than commercial batteries. Nowadays, researchers are paying attention on metal-organic frameworks (MOF) because of their tremendous versatility and used in supercapacitor applications. The present work investigates the synthesis and applicability of nickel-(BDC) framework (Ni-based MOF) utilizing electrode material for supercapacitor application. The fabricated Ni-based MOF electrodes were studied under different KOH molarity solutions via; 2 M, 4 M, and 6 M in a three-electrode system. Nickel-based MOF shows efficient results in a 6 M KOH solution with a specific capacitance of 778.7 F g⁻¹ at 16 A g⁻¹. Additionally, electrochemical impedance spectroscopy shows the minimum charge resistance in 6 M KOH solution compared with its counterparts. The Ni-based MOF electrode maintains its cyclic stability for 1000 cycles at 2 A g⁻¹. The reported outcomes may help in the development of novel MOF-based materials used in applications like supercapacitor and other electrochemical devices.

INTRODUCTION

We are facing the greatest challenges in the generation of energy solutions, storage, and devices. Currently, 80% of our energy needs are fulfilled by fossil fuel-based resources. However, these resources are finite and their combustion results in the emission of greenhouse gases, contributing significantly to environment alteration and global warming[1]. Beyond the realm of global warming, challenges about energy supply and consumption exert a profound impact on various environmental issues, encompassing air pollution, deforestation, ozone depletion, acid rain, and emissions of harmful materials. Effectively addressing these interconnected concerns is imperative for humanity to realize a sustainable energy future marked by minimal environmental degradation. Thus, energy production and storage are of prime focus for researchers all over the globe[2]. High-capacity and stable energy-storage technologies like supercapacitors and rechargeable batteries play a pivotal role in advancing technologies for electric vehicles, smartphones, computers, and various other applications[3].

Supercapacitors also referred to as electrochemical capacitors, encompass various types distinguished by distinct techniques for storing charge, such as electrical double-layer capacitance and pseudo-capacitance[4]. These mechanisms enable supercapacitors to achieve high power density and an extended lifespan. In the case of electrical double-layer capacitance, charge storage take place across the ion adsorption at the interface of a liquid electrolyte and an electrode without involving a redox process[5]. Conversely, pseudo-capacitance involves ultra-fast redox reactions either at the surface or within the bulk of an electrode. In comparison to traditional batteries and conventional capacitors, supercapacitors are deployed innovatively in energy storage devices[6]. Their distinct advantages position them as a compelling alternative to outdated storage technologies, characterized by outstanding specific power and energy capabilities, prolonged cycle stability, rapid charge-discharge rates, and cost-effective maintenance[7].

Metal-organic frameworks (MOF) are widely used as supercapacitors because of their advantageous characteristics, such as higher electron transfers and quick ion transport rate in numerous applications[8][9]. Metal-organic frameworks (MOF) found various field application, containing storage systems, adsorption, gas split-up, catalysis, and the development of various sensors[10]. Additionally, MOF exhibits a crystalline nature, large specific area, high porosity, uniformity of structures, functions, and chemical & thermal stability[11]. However, the MOF as electrode material has downsides like poor conductivity and stability[12].

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Wild Edible Plants as a Nutrition- Medicine Continuum- An Ethnobotanical Survey of Gawali Tribe in Nanded District (Maharashtra) India

It is essential to document the knowledge of traditional food and medicines from rural and tribal people before it vanishes completely. The present study focused on the documentation of plant species used by Gawali community for food source. The indigenous knowledge from local people of Gawali tribe of Nanded district of Maharashtra was collected through questionnaires, personal interviews and field survey conducted during 2014-17. About 51 wild edible plant species of medicinal importance belonging to 31 families were recorded. People use these plants for edible purpose and for healing health related problems. These species show high diversity of medicinal applications. To create awareness on sustainable use of wild edible plants, their conservation and special attention is the need of time.

Keywords : Conservation, Diversity, Gawali community, Traditional medicines, Wild edible plants.

Introduction

The agricultural practices of the ancient times provide clues of human dependency on plant resources for food. As per the availability of advanced techniques and cultivation methods new varieties have been developed over the wild varieties of crop plants for better agricultural production. Many rural peoples and tribal communities still used to grow the traditional wild races rather than new improved varieties of crop plants, though they are less productive over the new disease resistant, high yielding and tolerant varieties. This indicates the conservative approach of these people. But over the time only few plants have been explored as edible plants and are cultivated commercially along with their improved characteristics while other remains ignored and hence these plant species grow wildly in natural habitat without any cultivation practices. Such plant species which are potentially edible and have not come into cultivation practices are called as wild edible plant species. FAO (Food and Agriculture Organization) defined wild edible plants as the plants that grow spontaneously in self-maintaining populations in natural or semi natural ecosystems and can exist independently of direct human action" (Heywood, 1999).

Wild edible plants are available locally and their use is based on traditional knowledge. They need low input, low cost and provide greater benefits to poorer households, woman and children (Grivetti and Ogle, 2000; Fentahun and Hager, 2009; Shumsky *et al.*, 2014). Wild plants are worthy of attention to be developed as alternative source of food that the world would need in future to overcome food insecurity (Pullaiah, 2007).

Food insecurity and malnutrition has high impact on many developing and underdeveloped countries (Godfray, *et al.*, 2010). More than a billion people of every country on earth are suffered from micronutrient deficiencies (Food and Agriculture Organisation, 2012). Conventional crop plants are not sufficient to fulfil the requirement of food as well as their yield declines due to climate change and are expected to be severe

The recorded 51 wild edible plant species, belonging to 31 families, which show high diversity of medicinal applications. To create awareness on their sustainable use, their conservation and special attention is the need of time.

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