2024-25

3.5.1

The Number of Collaborative activities for research, Faculty exchange, Student exchange/ internship during the year

3.5.1 The Number of Collaborative activities for research, Faculty exchange, Student exchange/ internship during the year

Sr. No	Title of the Collaborative activity	Name of the partnering institution /industry/research lab with contact details	Year of commencement	Duration	Nature of Collaborative activity
1	Faculty & Student Exchange	Shri Shahaji Chhatrapati Mahavidyalaya , Dasara Chowk , Kolhapur	2024	1 Day	One Day Workshop under lead college Scheme on Empowerment of Citizens Through Financial Literacy
2	Faculty & Student Exchange	New College, Kolhapur	2025	1 Day	One Day Workshop under lead college Scheme on Research Promotion
3	Faculty & Student Exchange	Rajarshi Shahu arts and commerce college, Rukadi	2025	1 Day	Faculty and Student exchange programme
4	Faculty & Student Exchange	Colleges under lead college Scheme	2025	1 Day	One Day Workshop on changing Nature of Competitive Exams: Challenges & Approach
5	On Job Training	Analyte Pharma job Training Institute, Kolhapur	2025	19 Days	On Job Training in the Pharmaceutical and Instrumentation field
6	Research	Department of Hindi , Shivaji University, Kolhapur	2025	1 Year	Research paper Published on *Pankaj Subir Ke "Akal Main Ustav" Upanyas Main Kisan Jivan*
7	Research	Department of Physics, Devchand College, Arjunnagar, Kolhapur	2024	1 Year	Research paper Published on Stronger self-focusing of Gaussian Laser beam in Collisionless plasma based exponential Density Profile

RAJARSHI CHHATRAPATI SHAHAJI KOLHAPUR

8	Research	Kisan veer Mahavidyalaya, Wai, Dist. Satara	2025	1 Year	Research paper Published on A Performance Study of Prediction Model for preterm Birth and Mode of Delivery Based on Machine Learning Tools
9	Research	Jaysingpur College, Jaysingpur	2025	1 Year	Research paper Published on Drug Recommendation System Using Machine Learning Technique
10	Research	Vivekanand College, Kolhapur	2025	1 Year	Research paper Published on A Study the Impact of Household air pollution on human health using Machine Learning Techniques
11	Research	Shivaji University ,Kolhapur	2024	1 Year	Research paper Published on Navigating Fear and Duty :Cultural Subtext in the Fiction of Alistair Maclean
12	Research	Department of Chemistry ,Jagdamba Mahavidyalaya, Achalpur city	2025	1 Year	Research paper Published on Synthesis of (1,5-Diphenyl)-2,4-Dithiobiurete
13	Research	Department of Chemistry, G. S. Science, Arts and Commerce college, Kolhapur	2024	1 Year	Research paper Published on Efficient Synthesis and Antimicrobial potential of N-Mannich bases of 3,4-Dihydropyrimidin-2-(1H0-ones Catalyzed bt Cobalt Chloride Doped Polyaniline Composite
14	Research	Balasaheb Desai College, Patan	2024	1 Year	Research paper Published on Mineral Analysis of Medicinally Important Fern :Adiantum Philippense L
15	Research	Department of Chemistry KRP College, Islampur	2024	1 Year	Research paper Published on Crosslinked Chitosan-Polyvinyl Alcohol blend beads for removal and recovery of Cr(II)from wastewater
16	Research	Thin Film Research	2024	1 Year	Research paper Published on

		Laboratory, Dept. of Chemistry, Government Rajaram College, Kolhapur			Chemical Synthesis and Characterization Study of Nanocrystalline and Coral Rock-Like Kasterite Cu_2ZnSnS_4 (CZTS)Thin Films
17	Research	Yashvantrao Chavan Institute of Science,Satara Lead College of Karmaveer Bhaurao Patil University Satara	2024	1 Year	Research paper Published on An Efficient and environmental friendly synthesis of 1H-pyrazolo[1,2-b]phthalazine-5,10-dione in aqueous hydrotropic medium
18	Research	Fluorescence Spectroscopy research Laboratory ,Department of Chemistry Shivaji University ,Kolhapur	2024	1 Year	Research paper Published on Okra peel-derived nitrogen doped carbon dots :Eco-Friendly synthesis and multi functional applications in heavy metal ion sensing ,nitro compound detection and environmental remediation
19	Research	Research and Development ,Integrated product development, Dr. Reddy's Laboratories Ltd., Bachupally, Hyderabad, Telangana	2025	1 Year	Research paper Published on QbD-Enhanced HPLC Method Development for Vildagliptin and Metformin HCL Formulations
20	Research	Department of Medical Biotechnology and stem cell and regenerative	2025	1 Year	Research paper Published on Sustainable Synthesis of tunable emissive sulphur doped CDs:a

		Medicine,D.Y.Patil Education Society ,Kolhapur			synergistic approach for metal ion sensing and antimicrobial applications
21	Research	Dahiwadi College, Dahiwadi, Satara	2024	1 Year	Research paper Published on Activated carbon from pencil peel waste for effective removal of cationic crystal violet dye from aqueous solutions
22	Research	Shahajiraje Mahavidyalaya, Khatav, India	2024	1 Year	Research paper Published on Ultra-probe sonication assisted greener approach in aqueous hydrotropic media for the synthesis of pyranopyrazole derivatives
23	Research	The Institute of Science, Dr. Homi Bhabha State University, Mumbai	2024	1 Year	Research paper Published on Porous Structure of Fe_2O_3 thin films prepared for super capacitors via CBD Method :effect of molar concentration
24	BOOK	Lap Lambert Academic Publishing House, Germany	2017	Valid till date	Book Published
25	Research	Botanical Survey of India, Arid Zone Regional Centre, Jodhpur ,Rajasthan	2024	1 Year	Research paper Published on Epiphytic Pteridophytes of Arunachal Pradesh
26	Research	Department of Mathematics Shivaji University	2024	1 Year	Research paper Published on On Wavelet Transform as an Extension of Fractional Fourier Transform and Its Applications

27	Book	Department of chemistry, Vivekanand College, Kolhapur	2024	3 Years	B. Sc Part II Semester III Analytical Chemistry Chemistry Book
28	Book	Department of Chemistry Lal Bahadur Shashtri College, Satara	2024	3 Years	B. Sc Part II Semester IV Organic Chemistry Book
29	Book	Department of Chemistry Kisan Veer Mahavidyalaya,Wai	2024	3 Years	B. Sc Part I Semester II Physical Chemistry Book

Total No of Collaborations During Year (2024-25) = 29

Criteria-III

(Chairman)

RAJARSHI CHHATRAPATI SHAHU COLLEGE KOLHAPUR

I/C Principal,
Rajarshi Chhatrapati Shahu College
Kolhapur.

Principal,
Dr. Kadam L.D.
M.Sc., Ph.D.,

Rayat Shikshan Sanstha's
RAJARSHI CHHATRAPATI SHAHU COLLEGE,
Kadamwadi Road, Kolhapur – 416 003 (Maharashtra)
(Arts, Commerce, Science, B.C.A., B.C.S. and Vocational)NAAC
Reaccreditation (4th Cycle) : A++ (CGPA : 3.78)

Office Phone No. - (0231) – 2654658, 265027
E-mail : klpshahucol@gmail.com, Website : rcshahucollege.in

Outward No. /2024-25

Date: 05 / 10 / 2024

Univ. Affi. No. UKF-1092/4970/M-SHI-3/1994
Jr. College Code J23.09.001

प्रति,

मा.प्राचार्य

श्री शहाजी छत्रपती महाविद्यालय ,

कोल्हापूर.

विषय – पत्र जा.क्र. SSCM/६०२, अग्रणी महाविद्यालय योजने अंतर्गत एकदिवसीय कार्यशाळेत विद्यार्थी उपस्थितीबाबत ...

महोदय,

उपरोक्त विषयान्वये, आपल्या महाविद्यालयामध्ये शुक्रवार दिनांक ०५ ऑक्टोबर २०२४ रोजी आयोजित केलेल्या **"आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण"** या विषयावरील एक दिवसीय कार्यशाळेसाठी आमच्या महाविद्यालयातील वाणिज्य विभागातील खालील प्राध्यापक व विद्यार्थी उपस्थित राहतील.

अ.क्र	शिक्षकाचे नाव	विषय
१	प्रा. ए. बी. नंदूगावे	वाणिज्य विभाग

अ.क्र	विद्यार्थांची नावे	वर्ग
१	कु.गडकरी आफिया मेहबूब	बी.कॉम . भाग –१
२	कु. जाधव वैभवी राहुल	बी.कॉम भाग – १
३	कु. पाटोळे श्रुती दत्तात्रय	बी.कॉम भाग – १
४	कु. घाटगे स्तुती संदीप	बी.कॉम भाग –१
५	कु. शिंदे प्रियांका उत्तम	बी.कॉम भाग – १

H.O.D
Department of Commerce
Rajarshi Chhatrapati Shahu College
Kolhapur

RAJARSHI CHHATRAPATI SHAHU COLLEGE ★ KOLHAPUR

I/C PRINCIPAL
R.C. SHAHU COLLEGE
KOLHAPUR

Shri Shahu Chhatrapati Shikshan Sanstha's

Shri Shahaji Chhatrapati Mahavidyalaya

Dasara Chowk, Kolhapur

Accredited by NAAC in Third Cycle with Grade 'A' (CGPA-3.13)

The New College, Kolhapur Cluster

Department of Commerce & IQAC organized

One-day Workshop under Lead College Scheme, Shivaji University, Kolhapur

On

आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण

(Empowerment of Citizens through Financial Literacy)

Friday, 4th October, 2024

Certificate

This is to certify that Mr./Mrs./Miss./Dr. Afiya Mehboob Gadkari of Rajashri chh. shahu college, kolhapur has participated in the One-day Workshop organized on "आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण" (Empowerment of Citizens through Financial Literacy) on Friday, 4th October, 2024.

Mr. S. H. Kamble	Dr. P. B. Patil	Dr. R. D. Mandanikar	Dr. R. K. Shanediwan
Coordinator	College Coordinator, Lead College Scheme	Coordinator, IQAC	Principal

Shri Shahu Chhatrapati Shikshan Sanstha's

Shri Shahaji Chhatrapati Mahavidyalaya

Dasara Chowk, Kolhapur

Accredited by NAAC in Third Cycle with Grade 'A' (CGPA-3.13)

The New College, Kolhapur Cluster

Department of Commerce & IQAC organized

One-day Workshop under Lead College Scheme, Shivaji University, Kolhapur

On

आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण

(Empowerment of Citizens through Financial Literacy)

Friday, 4th October, 2024

Certificate

This is to certify that Mr./Mrs./Miss./Dr. Vaibhavi Rahul Jadhav of Rajashri chh. shahu college, kolhapur has participated in the One-day Workshop organized on "आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण" (Empowerment of Citizens through Financial Literacy) on Friday, 4th October, 2024.

Mr. S. H. Kamble
Coordinator

Dr. P. B. Patil
College Coordinator, Lead College Scheme

Dr. R. D. Mandanikar
Coordinator, IQAC

Dr. R. K. Shanediwan
Principal

Shri Shahu Chhatrapati Shikshan Sanstha's

Shri Shahaji Chhatrapati Mahavidyalaya

Dasara Chowk, Kolhapur

Accredited by NAAC in Third Cycle with Grade 'A' (CGPA-3.13)

The New College, Kolhapur Cluster

Department of Commerce & IQAC organized

One-day Workshop under Lead College Scheme, Shivaji University, Kolhapur

On

आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण

(Empowerment of Citizens through Financial Literacy)

Friday, 4th October, 2024

Certificate

This is to certify that Mr./Mrs./Miss./Dr. Shruti Dattatray Patole of Rajashri Chh. Shahu College, Kolhapur has participated in the One-day Workshop organized on "आर्थिक साक्षरतेद्वारे नागरिकांचे सशक्तीकरण" (Empowerment of Citizens through Financial Literacy) on Friday, 4th October, 2024.

Mr. S. H. Kamble	Dr. P. B. Patil	Dr. R. D. Mandanikar	Dr. R. K. Shanediwan
Coordinator	College Coordinator, Lead College Scheme	Coordinator, IQAC	Principal

SHIVAJI UNIVERSITY, KOLHAPUR

WORK IS WORSHIP
SHRI PRINCE SHIVAJI MARATHA BOARDING HOUSE'S, KOLHAPUR
(Awarded of 'An Ideal Institution' by Government of Maharashtra)

ncipal Dr. V. M. Patil
M.A., M.Phil., Ph. D.
man, Lead College Working Committee
9421111320 / 0231-2621187/88

THE NEW COLLEGE, KOLHAPUR

Affiliated to Shivaji University, Kolhapur & Reaccredited By NAAC with A+Grade
1062, 'A' Ward, Shivaji Peth, Kolhapur - 416 012 Maharashtra
E-mail : nck30.cl@unishivaji.ac.in nck@newcollege.ac.in Website : www.newcollege.ac.in

Dr. R. P. Ad
M.Com.,M.L.I.Sc.,M.Phil.
Member Secretory and Coord
940377

Ref.No. NCK/ 3091 /2024 - 2025

Date 13 MAR 2025

ad College Working
mmittee Members

प्रति,
मा.प्राचार्य,
राजश्री छ. शाहू कॉलेज, कदमवाडी, कोल्हापूर.

विषय :– न्यू कॉलेज, कोल्हापूर क्लस्टर अंतर्गत रिसर्च प्रमोशन ॲक्टीव्हिटी करीता मिळालेल्या संशोधन विषयास मंजुरीबाबत.

महोदय,

उपरोक्त विषयास अनुसरून, आपणास कळविणेत येते कि, शिवाजी विद्यापीठ अंतर्गत न्यू कॉलेज, कोल्हापूर क्लस्टर अंतर्गत योजनेव्दारे राबवल्या जाणाऱ्या रिसर्च प्रमोशन ॲक्टीव्हीटी करीता आपल्या महाविद्यालयातील खालील विषयाकरीता मंजूरी देणेत येत आहे.

अ.क	विषयाचे नाव	मार्गदर्शक व संशोधन
१	Waste derived carbonaceous materials for removal of water pollutants by adsorption technique	Dr. S. P. Pawar (Guide) Ms. Suhani A. Majgaonkar Ms. Shivani S. Gadkari Mr. Aftab M. Gadkari Mr. Omkar S. Kasture

संशोधन विषयांच्या अनुषंगाने संशोधकांना मार्गदर्शन करणेकरीता **न्यू कॉलेज, कोल्हापूर** येथे **सोमवार दि. १७/०३/२०२५** रोजी **सकाळी** ९:०० ते ५:०० या वेळेत Research Pramotion या विषयावर एकदिवशीय कार्यशाळेचे आयोजन केले आहे. तरी वरील विषयाचे संशोधन करु इच्छिणाऱ्या संशोधक विद्यार्थी व मार्गदर्शक यांना सदर कार्यशाळेस हजर असणे बंधनकारक असलेने संबंधीतांना पाठवून सहकार्य करावे.

प्रा.डॉ. आर.पी.आडाव
CO-ORDINATOR
LEAD COLLEGE SCHEME

प्राचार्य डॉ. व्ही. एम. पाटील
PRINCIPAL/CHAIRMAN
LEAD COLLEGE SCHEME

Shri. Prince Shivaji Maratha Boarding House's

The New College, Kolhapur.

A Workshop Organized by

Lead College Cluster

(Under Shivaji University Lead College Cluster Scheme, The New College, Kolhapur Cluster)

Promotion of Research

Monday 17th March, 2025

CERTIFICATE

This is to certify that Prof./ Dr./ Mr./ Mrs./ Miss. Aftab Mehboob Gadkari of Rajashri chattrapati Shahu College, Kop. participated in One Day Workshop on **'Promotion of Research'** organized by The New College, Kolhapur, under Lead College Research Sensitization Scheme of Shivaji University, The New College, Kolhapur Cluster on 17th March, 2025.

Dr. R. P. Adav
Co-ordinator
Lead College Cluster,
The New College, Kolhapur.

Dr. V. M. Patil
Principal,
The New College, Kolhapur

Shri. Prince Shivaji Maratha Boarding House's

The New College, Kolhapur.

A Workshop Organized by

Lead College Cluster

(Under Shivaji University Lead College Cluster Scheme, The New College, Kolhapur Cluster)

Promotion of Research

Monday 17th March, 2025

CERTIFICATE

This is to certify that Prof./ Dr./ Mr./ Mrs./ Miss. Onkar Shivshankar Kasture. of Rajashri chattrapti Shahu college. Kop participated in One Day Workshop on **'Promotion of Research'** organized by The New College, Kolhapur, under Lead College Research Sensitization Scheme of Shivaji University, The New College, Kolhapur Cluster on 17th March, 2025.

Dr. R. P. Adav
Co-ordinator
Lead College Cluster,
The New College, Kolhapur.

Dr. V. M. Patil
Principal,
The New College, Kolhapur

बाळासाहेब माने एज्युकेशन ट्रस्ट, रुकडी संचलित

राजर्षी शाहू कला व वाणिज्य महाविद्यालय, रुकडी

ता. हातकणंगले, जि. कोल्हापूर ☎ ०२३०-२४८६००३, फॅक्स ०२३०-[illegible]

E-mail - [illegible] Website - [illegible]

(शिवाजी विद्यापीठाशी संलग्नित)

संस्थापक अध्यक्ष कै. खास. रा. ह. तथा बाळासाहेब माने

अध्यक्षा - माजी खासदार डॉ. श्रीमती निवेदिता स. माने

सेक्रेटरी - खासदार श्री. धैर्यशील स. माने

प्र. प्राचार्य - डॉ. प्रशांतकुमार कांबळे

जावक क्र. ३०६८ / २०२४-२५

दिनांक १७।३।२०२५

प्रति,
मा. प्राचार्य,
राजर्षी छत्रपती शाहू कॉलेज,
कोल्हापूर.

विषय : **Faculty & Students Exchenge Programme आयोजनाबाबत...**

महोदय,

आपले महाविद्यालय आणि आमचे महाविद्यालय यामध्ये सामंजस्य करार झाला आहे. त्यानुसार आमच्या महाविद्यालयातील बी.कॉम. भाग २ या वर्गातील पाच विद्यार्थी व एक सहायक प्राध्यापक मंगळवार दि. १८/०३/२०२५ रोजी सकाळी ठीक ८.३० वा. आपल्या महाविद्यालयात Faculty & Students Exchenge Programme अंतर्गत सहभागी होत आहेत. तरी त्यांना सहभागी करून घ्यावे, ही विनंती

कळावे,

प्रा. (डॉ.) प्रशांतकुमार कांबळे
प्राचार्य
राजर्षी शाहू कला व वाणिज्य
महाविद्यालय, रुकडी.

RAYAT SHIKSHAN SANSTHA'S

RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR.

NAAC RE-ACCREDITED AS 'A++' GRADE CGPA 3.78

DEPARTMENT OF ECONOMICS

Date 20/03/2025

Faculty and Student Exchange Programme

Report

Department of Economics Organized Faculty and Student Exchange Programme on 18th March 2025 under the MoU signed by Rajarshi Shahu Arts and Commerce College,Rukadi.The main objectives of this activity are to share and exchange knowledge of both the colleges and acquaint with students the information regarding Rayat Shaikshan Sanstha's, Rajarshi Chhatrapati Shahu College,Kolhapur and facilities provided by the college.

Dr.H.V.Sankpal Professor, Department of Economics Rajarshi Shahu Arts and Commerce College, Rukadi visited Rajarshi Chhatrapati Shahu College,Kolhapur on 18th March 2025 along with the Students of economics in they visited Department of Economics, Library , Competitive Exam Guidance Centra, Swimming Tank and also participated in State Level Seminar organized by Department of Economics.

Outcome	Beneficiaries
• Students of Rukadi College know various facilities provided by Rajarshi Chhatrapati Shahu College.	07

Head
Department of Economics
Rajarshi Chhatrapati Shahu College,
Kolhapur.

R.C. SHAHU COLLEGE
KOLHAPUR

RAYAT SHIKSHAN SANSTHA'S

RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR.

Department of Economics

Subject - Student and Faculty Exchange Programme under MoU

Attendance List

18-03-2025

Sr.No	Name of the Student	Sign
1	Jiya Sachin Khot	JSKhot
2	Akshara Anil Londhe	AL
3	Pradakta Keshav Kumble	[illegible] Kumble
4	Prem Raghuraj Singh	Singh
5	Khadija Ikbal Bepari	KIB
6	Akshat Anil Ambure	[illegible]
7	Santoshi Shailendra Dhanvade	[illegible]
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Desai

Head
Department of Economics
Rajarshi Chhatrapati Shahu College,
Kolhapur.

CHHATRAPATI SHAHU ... RAJARSHI KOLHAPUR

"Education Through Self Help is our Motto" - Karmaveer

Estd.- 1961

Rayat Shikshan Sanstha's

Rajarshi Chhatrapati Shahu College, Kolhapur

Tal.- Karvir, Dist.- Kolhapur - 416 003

(Affiliated to Shivaji University,Kolhapur)

NAAC Reaccreditation 4th Cycle A++(CGPA- 3.78)

E-mail:klpshahucol@gmail.com **Website:** www.rcsc.ac.in Phone No.0231-2654658

I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.)

Ref. No.945 /2024-25 Dt. / /2025

11 FEB 2025

To,
The Principal,
All colleges under
The New College (Cluster), Kolhapur as a lead College

Subject: - About the participation in a Lead College Workshop

Reference: - NCK/2922/2024-2025 Dated 01 February, 2025.

Respected Sir,

We have a great pleasure that the Department of History and Competitive Examination Guidance Center is jointly organizing a one day workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on **Tuesday, 18/02/2025 during 10.00 a.m. to 4.00 p.m.**

Kindly depute ***One Faculty and Five Students*** for the above mentioned workshop.

For further details please Contact:
Prof. Dr. S. C. Khole - 9823978995
Dr. N. B. Walkunje - 9665709085

RAJARSHI CHHATRAPATI SHAHU COLLEGE ★ KOLHAPUR

I/C PRINCIPAL
C. SHAHU COLLEGE
KOLHAPUR

"Education through self-help is our motto" – Karmaveer

Rayat Shikshan Sanstha's

RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR

Department of History & Competitive Examination Guidance Center
Jointly Organizing

ONE DAY WORKSHOP

On

Changing Nature of Competitive Examination: Challenges & Approach

Under the Lead College Scheme of Shivaji University &
The New College (Cluster), Kolhapur as a Lead College

Tuesday, 18th February, 2025 — Venue: - Hall No. 101

PROGRAMME SCHEDULE

PARTICULAR		TIME
REGISTRATION, BREAKFAST & TEA 09:30 a.m. to 10:30 a.m.		
Inauguration	**Chief Guest** :-Prof. Dr. V. V. Maindargi Principal, D. R. K. College of, College, Kolhapur **Chairperson** :- Prof. (Dr.) D. R. Bhosale I/C Principal, Rajarshi Chhatrapati Shahu College	10.30 a.m. to 11.00 a.m.
Session-I	**Resource Person**:-Dr. Hrushikesh Dalavi Head, Dept. of History, Rajaram College, Kolhapur **Topic** :- Preparation for UPSC/MPSC: Challenges & Approach	11:00 a.m. to 12:00 p.m.
Session-II	**Resource Person**:- Mr. Gangaram Pawar Vidya Prabodhini, Kolhapur **Topic** :- Preparation for Banking and Other Exams: Challenges & Approach	12:00 p.m. to 01:00 p.m.
WORKING LUNCH (01:00 p.m. to 02:00 p.m.)		
Session-III	**Resource Person**:- Mr. Roodra Patil Vedh Foundation, Kolhapur **Topic** :- Preparation for Police, Army and Other Recruitments Exams: Challenges & Approach	02:00 p.m. to 03:00 p.m.
TEA		
Valedictory	**Chairperson** :- I/C Principal, Prof. (Dr.) D. R. Bhosale Rajarshi Chhatrapati Shahu College, Kolhapur (Feedback of Participants & Certificate Distribution)	03: 00p.m. to 04:00 p.m.

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RAYAT SHIKSHAN SANSTHA'S

RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR

DEPARTMENT OF HISTORY (2024 – 25)

A Lead College Workshop Report

Department of History and Competitive Examination Guidance Center jointly organized a one day workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** at 18th February 2018, under lead college scheme of Shivaji University & The New College (Cluster), Kolhapur.

In inaugural session chief guest Dr. Hrushikesh Dalavi (Head, Department of History, Rajaram College, Kolhapur) inaugurated the workshop. I/C Principal Prof. (Dr.) D. R. Bhosale was chairperson for this session and he has given valuable guidance to the participants.

During the 1st session, Dr. Hrushikesh Dalavi, (Head, Department of History, Rajaram College, Kolhapur) was resource person and he has given an excellent speech on *'Preparation for UPSC/MPSC: Challenges & Approach'* through PPTs. In the 2nd session Mr. Gangaram Pawar, (Vidya Prabodhini, Kolhapur) was resource person and he has given a speech on *'Preparation for Banking and Other Exams: Challenges & Approach'*. In this session Prin. Dr. Varsha Maindargi guided students about the *'Planning & Management for Upcoming Challenges in Competitive Exams'*.

Mr. Roodra Patil, (Vedh Foundation, Kolhapur) has worked as a resource person for the 3rd session entitled *"Preparation for Police, Army and Other Bharti Exams: Challenges & Approach"* In the valedictory function certificates were distributed to all participants through the auspicious hands of I/C Principal Prof. (Dr.) D. R. Bhosale and Mr. Roodra Patil.

In this workshop total 94 students and faculty members of various colleges participated. Feedbacks are collected form the participants. Prof. Dr. Supriya Khole (Head, Department of History) was coordinator of this workshop. Dr. Nilesh Waikunje (Assistant Professor, Department of History) and Dr. Yuvraj Mithari (Assistant Professor, Department of History) provided support in organizing this workshop.

Head
Dept. of History
R. C. Shahu College, Kolhapur

RAJARSHI CHHATRAPATI SHAHU COLLEGE KOLHAPUR

I/C PRINCIPAL
R.C. SHAHU COLLEGE
KOLHAPUR

One Day Lead College Workshop

'Changing Nature of Competitive Examination: Challenges & Approach'

Under the Lead College Scheme of Shivaji University and
The New College (Cluster), Kolhapur as a Lead College

Inauguration Session: Prin. Prof. (Dr.) D. R. Bhosale

Session - I: Dr. Hrushikesh Dalavi

Topic: Preparation for UPSC/MPSC: Challenges & Approach

Session - II: Prin. Prof. Dr. V. Maindargi

Member of Lead College Committee

Session - II: Mr. Gangaram Pawar

Topic: Preparation for Banking and Other Exams: Challenges & Approach

Session - III: Mr. Roodra Patil

Topic: Preparation for Police, Army and Other Recruitments Exams: Challenges & Approach

Session - IV: Valedictory Function

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Estd.- 1961

Rayat Shikshan Sanstha's

Rajarshi Chhatrapati Shahu College, Kolhapur

Tal.- Karvir, Dist.- Kolhapur - 416 003

(Affiliated to Shivaji University,Kolhapur)

NAAC Reaccreditation 4th Cycle A++(CGPA- 3.78)

E-mail:klpshahucol@gmail.com **Website:** www.rcsc.ac.in Phone No.0231-2654658

I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.)

Ref. No. 944/2024-25 Dt. 13/02/2025

To,
Prof. (Dr.) V. V. Maindargi,
Principal,
D. R. K. College of Commerce, Kolhapur

Subject: - Invitation as a Chief Guest for Lead College Workshop

Respected Madam,

If gives us immense pleasure to inform you that the Department of History & Competitive Examinations Guidance Center is jointly organizing a one day workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on **Tuesday, 18/02/2025.**

You are invited as a Chief Guest to inaugural function workshop and share your valuable insights.

Thanking You!

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.) Ref. No. /2024-25 Dt. / / 2025

To,
Prof. (Dr.) V. V. Maindargi,
Principal,
D. R. K. College of Commerce, Kolhapur

LETTER OF GRATITUDE...

Respected Madam,

We would like to extend our deep gratitude for your gracious presence as the Chief Guest of a lead college workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on Tuesday, 18/02/2025.

Your insightful speech has greatly enriched the event.

Thanking You!

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.)

Ref. No.945 /2024-25 Dt.13/02/2025

To,
Dr. Hrushikesh Dalavi,
Head, Department of History,
Rajaram College,
Kolhapur.

Subject: - Invitation as a Resource Person for Lead College Workshop

We have a great pleasure that the Department of History & Competitive Examinations Guidance Center is jointly organizing a one day workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on **Tuesday, 18/02/2025.**

It's our pride to invite you as a resource person to deliver a speech on ***"Preparation for UPSC/MPSC Exams: Challenges & Approach"*** at 11.00 a.m.

Thanking You.

O/C

Received

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.) Ref. No. /2024-25 Dt. / / 2025

To,
Dr. Hrushikesh Dalavi,
Head, Department of History,
Rajaram College,
Kolhapur.

LETTER OF GRATITUDE...

Respected Sir,

We would like to express our sincere appreciation and gratitude as you have delivered an excellent speech on ***"Preparation for UPSC/MPSC: Challenges & Approach"*** in one day workshop organized by the Department of History & Competitive Examination Guidance Center on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on Tuesday, 18/02/2025.

We express our heartfelt gratitude towards you for your contribution and would be honored to have you back soon.

With warm regards!!!

Received

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.) Ref. No.946 /2024-25 Dt.13/02/2025

To,
Mr. Gangaram Pawar,
Vidya Prabodhini,
Kolhapur.

Subject: - Invitation as a Resource Person for Lead College Workshop

Respected Sir,

We have a great pleasure that the Department of History & Competitive Examinations Guidance Center is jointly organizing a one day workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on **Tuesday, 18/02/2025.**

It's our pride to invite you as a resource person to deliver a speech on ***"Preparation for Banking and Other Exams: Challenges & Approach"*** at 11.00 a.m.

Thanking You.

O/C

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.) Ref. No. /2024-25 Dt. / / 2025

To,
Mr. Gangaram Pawar,
Vidya Prabodhini,
Kolhapur.

LETTER OF GRATITUDE...

Respected Sir,

We would like to express our sincere appreciation and gratitude as you have delivered an excellent speech on ***"Preparation for Banking and Other Exams: Challenges & Approach"*** in one day workshop jointly organized by the Department of History & Competitive Examination Guidance Center on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on Tuesday, 18/02/2025.

We express our heartfelt gratitude towards you for your contribution and would be honored to have you back soon.

With warm regards!!!

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.)

Ref. No947 /2024-25 Dt.13 /02/ 2025

To,
Mr. Roodra Patil
Vedh Foundation,
Kolhapur

Subject: - Invitation as a Resource Person for Lead College Workshop

Respected Sir,

We have a great pleasure that the Department of History & Competitive Examinations Guidance Center is jointly organizing a one day workshop on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on **Tuesday, 18/02/2025.**

It's our pride to invite you as a resource person to deliver a speech on ***"Preparation for Police, Army and Other Bharti Exams: Challenges & Approach"*** at 01.00 p.m.

Thanking You.

O/C
Roodrag

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I/C Principal Prof. (Dr). D. R. Bhosale (M.A., SET, Ph.D.) Ref. No. /2024-25 Dt. / /2025

To,
Mr. Roodra Patil
Vedh Foundation,
Kolhapur

LETTER OF GRATITUDE...

Respected Sir,

We would like to express our sincere appreciation and gratitude as you have delivered an excellent speech on ***"Preparation for Police, Army and Other Bharti Exams: Challenges & Approach"*** in one day workshop jointly organized by the Department of History & Competitive Examination Guidance Center on ***'Changing Nature of Competitive Exams: Challenges & Approach'*** under lead college scheme of Shivaji University, Kolhapur and The New College (Cluster), Kolhapur as a lead College on Tuesday, 18/02/2025.

We express our heartfelt gratitude towards you for your contribution and would be honored to have you back soon.

With warm regards!!!

Roodraa

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Rayat Shikshan Sanstha's

RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR

Department of History & Competitive Examination Guidance Center Jointly Organizing

ONE DAY WORKSHOP

On

‘Changing Nature of Competitive Examination: Challenges & Approach’

Under the Lead College Scheme of Shivaji University &
The New College (Cluster), Kolhapur as a Lead College

Tuesday, 18th February, 2025 **Venue: - Hall No. 101**

RAJARSHI CHHATRAPATI SHAHU COLLEGE KOLHAPUR

Registration

Sr. No.	Name of the Participant	Name of the College	Class	Sign
01	Saranga tishor Kamble	R.C. shahu college, kolhapur	B.A. II	Skamble
02	Shrutika Tayappa Baudane	—"—	B.A. II	S.T. Baudane
03	Barakingaohdiba Shelake	—"—	B.A. II	Shelake
04	Nikhil Gangaram katal	—"—	B.A. II	N.G.k
05	Shital Dhondiram khondal	—"—	B.A. II	ShitalD.K
06	Jayvant Gangaram Ghorale	—"—	B.A. I	Jayvant
07	Aftab Mehboob Gadkari	—"—	B.Sc - III (chem)	[illegible]

Sr. No.	Name of the Participant	Name of the College	Class	Sign
08	Pratiksha Balaso Phalke	R.C. Shahu college Kolhapur	B.Com - I	Pratiksha
09	Megha Subhash Pujari	R.C. Shahu College. kolhapur	B.Com - I	M.Pujari
10	Afiya Mehboob Gadkari.	R.C. Shahu College, Kolhapur	B.Com - I	A.M.G.
11	Shruti Dattatrey Patole	R.C. Shahu College, kolhapur	B Com - I	Patole
12	Vaibhavi Rahul Jadhav.	R.C. Shahu College. Kolhapur	B.Com - I	V Jadhav.
13	Stuti Sandeep Ghatge	R.C. Shahu College, Kolhapur.	B.Com - I	S.S. Ghatge
14	Rakesh Basu Saladagi	— " —	B. com - I	R.
15	Krushnalee Avinash kute.	— " —	B. Com III	K Kute
16	Siddhi Dilip Patil	— " —	B. Com III	Siddhi.
17	Vainath Rajaram Mane	New College, Kolhapur.	B.A.I.	
18	Pratiraj Sarjerao Patil	— " —	B.A.I.	Patil
19	Vaishnavi Sambhaji Koparde	— " —	B.A.I.	V.S. Koparde
20	Disha Satappa Sarate	— " —	B.A.I.	D.S. Sarate.
21	Eshwari Rohit Salunkhe	Rajaram college kolhapur	B.A.I	ERS
22	Samruddhi Sanjay Sutar	— " —	B.A.I	Sutar.
23	Tanuja Mansing Gaikwad.	— " —	BSc - I	Gaikwad.
24	Prafulla Prakash Virkar.	Rajaram College Kolhapur.	B.A I	P.P. Virkar
25	Nikhil Uttareshwar Baad	Rajarshi chhatrapti shahu college	BCS - III	Baad
26	Sabiya Liyakat Nalband	Mahaveer Mahavidyalay kolhapur	B.A B.ed II	Jadhav
27.	Sakshi Sanjay Pauskar	— " —	B.A. B Ed II	S.S. Pauskar
28.	Dr. Dhananjay P. Deolalkar	Rajaram College, Kolhapur.	M.A. Ph.D.	
29.	Dr. Ankush Ramchandra Bansode	Mahavir Mahavidyalaya, Kolhapur	Associate professor	
30.	Dr. Shashikant S. Annadate	— " —	— " —	

Sr. No.	Name of the Participant	Name of the College	Class	Sign
31	Priyanka Rajaram Patil.	Dept. of History, Shivaji Uni. Kop	Ph. D (arts)	PRPatil
32.	Pankaj Vishwanath Gavali	Rajaram College, Kolhapur	B.A.-I	
33.	Kedar MAHADEV Patil	GKG College -11-	BA-II	KMPatil
34	Prutibha Bhimarao chandane.	RCSC Kolhapur.	B.Com -III	P.b.chandane
35	Rohit R. Gawas	R.C.S.C Kop	B.A III	R.R.Gawas
36	Siddhant S. Sanade	R.C.S.C. Kolhapur	B.Sc -I	
37	Rushikesh Krushna kamble	R.C.S.C Kolhapur.	BA II	
38.	~~Shantanu~~ Shantanu.	Rajaram college, kolhapur.	B A - I	Shantanu
39.	Janhavi Jadhav	Shree Shahaji Chh. Mahavidyalaya Kop	B.A. I.	J.N. Jadhav
40.	Mansi Magdum	-11-	B. A. I	MBMagdum
41.	Mayur S. Kamble	SSCM -11-	B.A.II	Mkamble
42.	Sandip Ramchandra Kamble	-11-	B.A.II	Kamble.
43.	Prof. Dethe Vijay J.	-11-	Faculty	
44.	Prashant P. Kudekar	The New College, Kolhapur	-11-	
45.	Ashutosh Avinash Rajput	The new college Kolhapur	BA. II	ARajput
46.	Stavan Gopalkrishna Kalekar	The Night college, Kolhapur.	B.A. I	Skalekar
47.	Parth Vishwas Kamble	the Night college Kolhapur	B.A. I	P.V.K
48.	onkar sunil Ghosalkar.	the Night College, Kolhapur.	B.A.I	OSG
49.	Prof. Chinmyi Pradip Sangale	Kamala college kolhapur	Faculty	
50.	Sanika shital Upadhye	Kamala college kolhapur	B.A II	Upadhye
51.	pranavi prakash Ghalap	-11- -11- -	B.A II	Ghalap
52.	Sakshi Vidyanand Mathpati	-11- -11- -	BA II	S.V.Mathpati
53.	Bhakti yuvraj Vhalar	-11- -11- -	BA II.	B.Y.Vhalar

Sr. No.	Name of the Participant	Name of the College	Class	Sign
54	Prof. Dr. Desai M.B	R.C.S.C. Kolhapur	Faculty	Desai
55.	Pratik Prakash Nagadum	Mahavir Mahavidyalaya kop.	B.A.B.Ed II	Nagadum
56.	Najnin Sameer Nadaf	Mahavir Mhavidyalay Kop.	B.A.B.ed II	N.S.Nadaf
57.	Dnyaneshwari Kashinath kurale	Mahavir Mharidyalay kop.	B.A.BEd II	D.K.Kurale
58.	Shankar Haridas Pawar	Night College. Kolhapur	.Factulty	
59.	DR. Santosh Vitthal Gawai	D.R.K. College of Commerce	Faculty	
60	Saniya shakil Momin	D.R.K college of commerce.	B.com I	Smomin
61.	Sanika chandrakant Falake	D.R.K college of commerce	B.com I	Sfalake
62.	Tejaswini Nandkishor Salankar	D.R.K college of commerce	B.com I	
63.	Bhaliksha Hambirrao Patil	D.R.K college of commerce	B.com I	
64.	Shivani Shailendra Indulkar	D.R.K. College of commerce	B.com I	Shivani
65.	Chinmay Rajaram Sangavkar.	D.R.K. College of Commerce	B.Com I	C.R.Sangavkar
66	MAYURESH SUSHANT PATIL	D.R.K. College of Commerce	B.Com I	
67.	Swarupa Mahesh Lad	D.D. Shinde Sarkar College	B.A. I	Swlad
68.	Samruddhi Suresh Patil	D.D. Shinde Sarkar College	B.A.I	
69.	Sheetal Sanjay Singh	D.D. Shinde Sarkar College	B.A.I	
70.	Somanath Bhanudas Sotapute	Rajaram college. KOP	Factulty	
71	Pranjali Krushnat Powar	Night college of Arts and commers	B.COM-II	
72	Sammed Ajay Bahirshet	Night college of Art Sand Commers	B.COM-I	S.A.B
73	YASH VIJAY KUMBHAR	R.C. Shahu College Kolhapur	B.C.S-III	
74	Suraj Mahesh Hundare	R.C.S.C. Kolhapur	B.C.S-III	
75	Santosh Shamrao Patil.	R.C.S.C kolhapur	B.S.C -I	
76	Khadija Nisar Mutwalli	R.C.S.C. Kolhpur.	B.A -II	

Sr. No.	Name of the Participant	Name of the College	Class	Sign
77	Diksha Vikram Kamble	R.C.S.C Kolhapur	BA - III	D.V.K
78	Kubez Krushnath Bhogam	R.C.S.C Kolhapur	BA - III	KKB
79	Varsha Ananda Rayjade	R.C.S.C Kolhapur	BSC - II	
80	Shraddha Bhagawan sawant	R.C.S.C Kolhapur	BSC - II	Shradha
81	Aaliya Riyaj Shaikh	R.C.S.C Kolhapur	B.A. I	Shaikh.
82	Ashwini Ganesh Lokhande	R.C.S.C. Kolhapur	B.A. I	Lokhande.
83	Vivek Hindurao Mankar	— " —	B.A. I	Vivek
84	Pranav Vikas yadav.	— " —	B.A. I P.V. yadav.	P.V. yadav.
85	Rupeshkumar Nirendar yadav	— " —	B.A.I	
86	Dr Yuvraj Anandrao Patharkar	R.C.S.C Kolhapur	Faculty	
87	Dr. Nilesh B. Nalkurje	— " —	— " —	
88	Thanekar B.M.	R.C.S.C. Kolhapur	— " —	
89	Sonekar V.V	R.C.S.C. Kolhapur	— " —	
90	Mrs. Sumaiya M. Kazi	R.C.S.C. Kolhapur	Faculty	
91	Ms Kalyani Sathe	" — — "	— " —	
92	Kamble R.R.	— " —	Faculty	
93	Smt. S.R. Majagaonkar	— " —	Faculty	
94	Dr Patil Anubhuti H.	— " —	Faculty	
95				
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97				
98				
99				

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RAYAT SHIKSHAN SANSTHA'S

RAJARSHI CHHATRAPATI SHAHU COLLEGE, KOLHAPUR

ON JOB TRAINING

Analyte Pharma Job Training Institute, Kolhapur

SUBMITTED

TO

SHIVAJI UNIVERSITY

For the partial fulfilment of the award of degree of

MASTER OF SCIENCE

IN

ANALYTICAL CHEMISTRY

BY

MISS. SNEHA SURESH KALE

DEPARTMENT OF CHEMISRTY

2024-25

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SUBMITTED

TO

SHIVAJI UNIVERSITY

For the partial fulfilment of the award of degree of

MASTER OF SCIENCE

IN

ANALYTICAL CHEMISTRY

BY

MR. MAHADEV SATUPPA KAMBLE

DEPARTMENT OF CHEMISRTY

2024-25

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पंकज सुबीर के 'अकाल में उत्सव' उपन्यास में किसान जीवन

शोध छात्र
कु.गीता रामचंद्र पाटील
हिंदी विभाग
शिवाजी विश्वविद्यालय, कोल्हापुर
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प्रो. डॉ. डी. आर. भोसले
प्र.प्रधानाचार्य
राजर्षी छत्रपती शाहू कॉलेज, कदमवाडी,कोल्हापुर.

प्रस्तावना-

भारत कृषि प्रधान देश है और 'जय जवान जय किसान' का नारा बहुत ही लोकप्रिय है। ग्रामीण भागो में किसान खेती करते है और अर्थव्यवस्था में महत्त्वपूर्ण भूमिका निभाते है। ऐसा माना जाता है कि अर्थव्यवस्था में किसान का कार्य 'रीढ़ की हड्डी' जैसा है। खाद्यान्न, औद्योगिकीकरण के लिए कच्चे माल का निमार्ण करनेवाला महत्त्वपूर्ण सारथी है। लेकिन अर्थव्यवस्था को मजबूत बनाने वाला किसान आज राजनीतिक भ्रष्टाचार आर्थिक दलाली जैसे अन्य समस्याओं से संघर्ष करता हुआ दिखाई दे रहा है।

पंकज सुबीर जी का 'अकाल में उत्सव' इस उपन्यास में किसान जीवन का वास्तविक चित्रण किया गया है। पंकज सुबीर जी को युवा साहित्यकार नाम से जाना जाता हैं। पंकज सुबीर जी मध्यप्रदेश के सिवनी मालवा में जन्में हैं और पत्रकारिता से उनका नाता होने के कारण वे समाज के हर वर्ग के दु:ख-दर्द से परिचित हैं। उसका ही प्रतिबिम्ब 'अकाल में उत्सव' उपन्यास में दिखाई देता है।

किसान का अर्थ-

'किसान' शब्द की व्युत्पत्ति संस्कृत भाषा के 'कृषाण' से हुई है। 'किसान' वह होता है, जो अपने पितृक या अपने खुद खरीदे हुए जमीन पर सरकारी नियम के

Stronger Self-focusing of Gaussian Laser Beam in Collisionless Plasma Based Exponential Density Profile

K. Y. Khandale[1,2], A. T. Valkunde[3(✉)], S. S. Patil[4], P. T. Takale[1], R. T. Patil[2], A. S. Patil[2], S. D. Patil[4], and M. V. Takale[1(✉)]

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Abstract. The nonlinear features of intense Gaussian laser beams traversing through collisionless plasma along with tangent upward density ramp as well as exponential density profile have been investigated theoretically in the current paper. Naturally, the ponderomotive force is primarily responsible for the collisionless plasma's nonlinear dielectric function. The differential equations for the beam width parameter (BWP) f have been constructed and numerically solved using Akhmanov's parabolic wave equation approach via paraxial and Wentzel-Kramers-Brillouin (WKB) approximations. By utilizing the fourth-order Runge–Kutta method the numerical computation is completed. The noteworthy impact of exponential density profile on propagation dynamics of a Gaussian laser beam is precisely explored and correlated with tangent upward density ramp profile. It is revealed that an exponential density ramp, rather than a tangent upward density ramp, leads the laser beams to become highly focused.

Keywords: Density ramp · Self-focusing · Plasma · Gaussian · Wentzel-Kramers-Brillouin approximation

1 Introduction

Neutral and charged particles combine to form the quasineutral gas known as plasma, which displays collective performance. Self-focusing is a fundamental, 3rd order, and fascinating nonlinear optical phenomenon in which an intense laser beam impacted on a medium modifies the optical characteristics so that the beam comes to focus within the medium. The three key mechanisms that aid to changes in the dielectric function of the plasma in the study of laser-plasma interactions: (i) collisional, (ii) ponderomotive force, and (iii) relativistic. The optical indemnity generated in solids by high-power laser beams is frequently caused by self-focusing [1, 2]. In addition to being of technological interest, the interaction of ultra-high-power laser beam with plasmas is also enriched

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A Performance Study of Prediction Model for Preterm Birth and Mode of Delivery Based on Machine Learning Tools.

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Abstract: Preterm births affect around 15 million children a year worldwide. Current development in science and technology in medical field the efforts focus on mitigating the effects of the pre-maturity, not on preventing it. In this study, we studied different maternal health factors like Age, Height, Weight, BMI, BMI Category that affect on preterm birth and Similarly, prediction of mode of delivery based on Age, Height, Weight, Blood Pressure, TSH Level, HB . The objective of this study was to develop and compare machine learning predictive models for preterm birth based on logistic regression, random forest and stratified k-fold cross validation machine learning algorithms for detecting the delivery method is Normal or C- section, our study shows that model based on logistic regression show high accuracy than random forest for predicting Preterm births whereas model based on random forest shows excellent performance with high accuracy than logistic regression and stratified k-fold cross validation for prediction of mode of delivery. Therefore we use random forest model is used for real data prediction.

Keywords: Machine Learning, Logistic Regression, Stratified K-fold Cross Validation, Random Forest, ROC -AUC Curve.

Introduction: Preterm births affect around 15 million children a year worldwide. Current development in science and technology in medical field the efforts focus on mitigating the effects of the pre-maturity, not on preventing it. Although caesarean(C-Section) deliveries hold life-saving potential, their increasing rate poses a substantial global health challenge. By 2030, it is projected that around 28.5% of all global births will involve caesarean sections(C-Section), which equates to approximately 38 million women annually [1]. In India, CD rates have steadily increased. Data from the National Family Health Surveys (NFHSs) demonstrate an increase in the CD rates 8.5% in 2005–2006, 17.2% in 2015–2016, and 21.5% in 2019–2021[2]. Preterm birth refers to the delivery of a baby completing 37 weeks of gestation it is a global public health issue and one of the leading causes of Neonatal Mortality and Morbidity. Nearly 15 million infants are born prematurely worldwide, and more than 1 million die from preterm birth and its complications before the age of 5 [3]. Understanding the cause risk factors and prevention strategies is essential for improving maternal and child health outcomes. Recent data indicates that India recorded the highest number of preterm births old wide in 2020 with approximately 3.02 million cases, according for 20% of all preterm births globally.PTB not only causes death and diseases in the new born, but also causes anxiety and depression in postpartum women [4]. The choice of delivery mode has a significant impact on the health of both mothers and infants. With the continuous advancement of medical technology, the global utilization rate of caesarean section as a crucial delivery method is increasing [5]. Therefore, it is essential to deeply understand the factors influencing the mode of delivery for predicting and preventing caesarean section. The rate of C-section deliveries in India has risen significantly over the years, increasing from 8.5% in 2005-06 to 21.5% in 2019-21. This increasing rate also raises questions about whether all C-section are medically necessary. Maternal health place a crucial role in determining the mode of delivery, which can be either vaginal or caesarean section (C-section). Understanding and the predicting model of delivery based on maternal health parameters have becomes essential for optimizing maternal health outcomes. Advancement and technology, particularly in machine learning (ML) and artificial intelligence (AI) have, significantly enhanced the ability to predict mode of delivery by analysing various maternal health parameters. Our research focuses on exploring factors affecting both C-section and normal deliveries. In this study examine how Age, Weight, Height, TSH levels, Blood Pressure, HB contribute to delivery outcomes. The objective of this study was to develop and compare machine learning predictive models for preterm birth based on logistic regression, random forest and stratified k-fold cross validation machine learning algorithms for detecting the delivery method is Normal or C- section.our predictive model assist health care providers in making informed decisions there by improving maternal health outcomes.

Objectives:

- Statistical Analysis of factors affecting Preterm birth.
- To build a predictive model to detect preterm birth based on maternal health factors.
- To analyze whether Age and BMI Category differ significantly in both group (preterm risk and no preterm risk).
- To analyze age-wise distribution of mode of delivery.
- To analyse the relationship between the mode of Normal vs. caesarean delivery and maternal age.
- To evaluate the prevalence of anemia among women following different delivery methods
- To build a predictive model based on maternal health factors.

Literature Review: Preterm birth is becoming a vital public health concern, given its correlation with neonatal mortality and morbidity. The causation of preterm birth is complex and multifactorial issue therefore remains the subject of considerable research and investigation. A study conducted by Richard P Dickey, Xu Xiong examined the effect of Height, Weight, Body mass

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Drug Recommendation System Using Machine Learning Technique

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Abstract: In today's digital era healthcare is one among the major core areas of the medical domain. People trying to find suitable health-related information that they are concerned with. The Internet could be a great resource for this kind of data, however you need to take care to avoid getting harmful information. In medical emergencies, rapid and precise drug recommendations are crucial for patient survival and effective treatment. A drug Recommendation System in machine learning (ML) is a software application designed to assist healthcare professionals and patients in selecting the most appropriate medication. The system processes comprehensive patient data, including medical histories and real-time health indicators, to provide accurate drug recommendations In this article our main aims to introduce a machine learning-based drug recommendation system based on four different methods like Random Forest, SVM, Passive-Aggressive and Logistic Regression (Over) classifiers. Which are analyses the reviews and predict conditions based on these conditions recommended relevant top five drugs. Our study shows that random forest method is superior as compared to logistic regression, passive aggressive, support vector machine. Passive aggressive method is give excellent result as compared to support vector and logistic regression. Support vector machine is better as compared to logistic regression In overall comparison the performance of logistic regression is worst.

Keywords: Drug recommendations system, machine learning, text analysis, TF-IDF, Random Forest, Logistic Regression, SVM, Passive-Aggressive.

Introduction: The rise in coronavirus cases is rapid, leading to a shortage of doctors. There are fewer doctors in rural areas compared to cities.[1] Since medical school takes between 6 and 12 years to complete, this issue has worsened, making it hard to bring in more doctors. A telemedicine framework should be fully utilised during this challenging period.[1]The frequency of clinical mistakes has increased in modern healthcare environments. Medication-related errors affect more than 200,000 people in China and 100,000 in the US annually. Over 40% of doctors, especially experts, make mistakes while writing prescriptions. This occurs because their decisions are based on a limited scope of knowledge, which influences the solutions they provide [3][4]. For patients who need professionals with an in-depth understanding of microscopic organisms, antibacterial agents, and patient care, choosing the best prescription is essential [2]. Due to new research, clinical personnel can access more medications and diagnostics daily. As a result, doctors find it more and more challenging to choose the best course of action or drugs for patients based on their symptoms and medical background.

Computer applications have significantly improved with the introduction of artificial intelligence (AI). Emulation of human cognitive processes in digital systems is at the heart of artificial intelligence. The development of AI is mainly dependent on machine learning methods, which include data collection, rules for information extraction, the production of both approximations and exact conclusions, and the confirmation of these results. The effectiveness of artificial intelligence is largely contingent upon the precision of the algorithms employed in machine learning. The precision of machine learning algorithms is predominantly contingent upon substantial training datasets. In contemporary times, a vast amount of data is available for training systems. The integration of artificial intelligence into the drug development process has increased. Currently, AI is pivotal in the analysis and advancement of drug discovery. Pharmaceutical companies, research and development institutions focused on AI, and medical professionals can collaborate to investigate new medicinal solutions tailored to specific needs. Clinical trials and medical techniques are typically used to assess the safety of drugs. However, based on their personal experiences, patients—significant stakeholders—can provide insightful

A Study the Impact of household air pollution on human health using Machine Learning Techniques.

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Abstract: Due to the rapid development of technology, urbanization and increased population, air pollution has become a hot topic, in particular because of the effects on health. However, much of the focus has been on outdoor air pollution as well as indoor air pollution . Some of the most important sources of indoor air pollution are Volatile Organic Compounds (VOCs) and Particulate Matter (PM). There are a variety of VOCs emitted from modern household products (e.g., paints, lacquers, cleaning liquids, furnishings, copiers, printers, glues, adhesives or permanent markers). Air pollution is a major environmental health threat. Exposure to fine particles in both the ambient environment and in the household causes about seven million premature deaths each year. The main indoor air pollutants are Volatile Organic Compounds (VOCs) and Particulate Matter (PM). PM sources included smoking, cooking, heating, candles, and insecticides, whereas sources of coarse particles were pets, housework and human movements. VOC sources included household products, cleaning agents, glue, personal care products, building materials and vehicle emissions. This public health crisis is receiving more attention, but one critical aspect is often overlooked: how air pollution affects children in uniquely damaging ways. Recent data released by the World Health Organization (WHO) show that air pollution has a vast and terrible impact on child health and survival. In this study we take secondary data of India was taken from git hub. Analyses the data by using machine learning models like Random search CV, Bagging Classifier, Linear regression, logistic regression, XG Boost , for comparing the all the factors of AQI values useing linear regression ,logistic regression and XG Boost models ,it is observed that XG Boost has high accuracy than linear regression ,logistic regression and logistic shows better performance as compared to linear regression and it is shows that for PM2.5 values randomized search CV and for AQI values of all factors XG Boost and logistic regression are fitted good.

Keywords: Bagging Classifier, Randomized Search CV, Linear regression, logistic regression, XG Boost ,Public Health, Air Quality Index, and Household Air Pollution.

Introduction: Pollution is becoming an alarming threat to our planet day after day. Food pollution has been the focus of national and international public health organisations, particularly pesticide residues and bioaccumulating substances. They have also focused on reducing outdoor air pollution caused by cities, factories, and automobile exhaust emissions. Meanwhile, whereas people in high-income countries (HICs) spend much of their lives indoors, the pollution of the indoor environment still needs to be addressed [1–3]. Indeed, domestic air and indoor pollution can be traced back to prehistory, when humans first moved to temperate climates, started building shelters, and used fire for cooking, heating, and lighting. Indoor pollution is a global health issue. Today, all over the world, about 2.4 billion people still make food with solid stuff (like wood, farm leftovers, coal, and animal poop). Many of these individuals are impoverished and reside in low- and middle-income nations, with a significant gap between urban and rural settings. In 2020, just 14% of people living in urban areas depended on dirty fuels and outdated technologies, in sharp contrast to the 52% rate of the global rural population.[4]. Despite transitioning from biomass fuels to petroleum products and electricity accompanying modernisation in developed countries, pollution remains a persistent threat to public health [5]. Although inhalation is the primary way indoor pollutants are exposed, it is important to consider cutaneous and oral exposure, especially for children who frequently interact with their hands and frequently participate in activities that involve contact with floors [6][7]. According to Wilson's research, kids touch their mouths, eyes, and noses more often than adults do. In particular, hand-to-mouth contact may be

NAVIGATING FEAR AND DUTY: CULTURAL SUBTEXT IN THE FICTION OF ALISTAIR MACLEAN

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ABSTRACT :

This paper explores the politics and culture within Alistair MacLean's novels *Where Eagles Dare* and *The Guns of Navarone*. While these novels are primarily recognized as war narratives, they are also rich with underlying political and cultural motifs that reflect the socio-political climate of the Cold War era. Through a close analysis of these two works, this study reveals how MacLean's novels, set against the backdrop of World War II, are imbued with the cultural anxieties and political tensions characteristic of the mid-20th century. *Where Eagles Dare* is a quintessential example of Cold War paranoia expressed through a World War II setting. The novel's plot, centered on a covert mission to infiltrate a Nazi stronghold and uncover a traitor within the British ranks, resonates with the era's fear of espionage and internal subversion. This narrative of betrayal and deception can be seen as a reflection of the widespread suspicion and fear of communist infiltration that permeated Western societies during the Cold War. Additionally, the novel's emphasis on technological details in warfare mirrors the real-world technological competition between the superpowers, particularly in the fields of espionage and military innovation. Major Smith, the protagonist of *Where Eagles Dare*, embodies the ideal of British heroism, displaying traits of bravery, resourcefulness, and loyalty that were central to the British cultural identity during the post-war period. This portrayal reinforces the cultural narrative of British resilience and moral superiority, which was crucial in the context of Cold War ideological battles. Similarly, *The Guns of Navarone* which presents a narrative focused on a World War II mission to destroy a strategically important German artillery installation, also reflects Cold War cultural and political themes. The novel's diverse group of characters from different Allied nations symbolizes the unity and cooperation necessary to combat the common enemy, which in the Cold War context, can be seen as a metaphor for the Western alliance against communism. The depiction of extreme survival and endurance in harsh conditions serves as a metaphor for the resilience required during the prolonged Cold War period, where both Western and Eastern blocs faced ongoing tension and uncertainty.

KEY WORDS: World War II, Cold War, Cultural Motifs, Moral Ambiguity, Survival and Endurance, Espionage.

INTRODUCTION :

While Alistair Maclean's novels are primarily recognized for their intense action and complex plots, they encapsulate a rich cultural and political subtext that reflects the profound impact of World War II and the Cold War on mid-20th century society. This research paper aims to comprehensively examine how these historical events shaped MacLean's work and contributed to the evolution of a new literary genre. The primary focus of this study is to explore the deep-seated influence of geopolitical tensions on MacLean's writing, particularly in his novels

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SYNTHESIS OF (1,5-DIPHENYL)-2,4-DITHIOBIURETE

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Abstract

Recently in this laboratory, a direct, suitable and simple method for the synthesis of (1,5-Diphenyl)-2,4-dithiobiurete (3a). A novel (1,5-diphenyl)-2,4-dithiobiurete (3a) was synthesized by the interacting 1-phenylthiocarbamide (1a) with phenylisothiocyanates (2a) in acetone-ethanol medium on water bath. The reaction mixture was filtered in hot conditions, after distillation of excess solvent, faint yellow coloured crystals were obtained, recrystalized from ethanol. The structure of the synthesized compounds was justified on the basis of chemical characteristics, elemental and spectral analysis.

Keywords: Phenylthiocarbamide, phenylisothiocyanate, acetone, ethanol, etc.

Introduction

Thiocarbamido, dithiobiureto and triazino nucleus containing drugs possess an important applications and significances in medicinal, pharmaceutical, industrial, agricultural and biochemical sciences[1-8]. The important reactions of amino compounds have been briefly investigate by Pandey[9], Pathe[10], Berad[11], Aprajit[12], Tayade[13], Deohate[14] and Bhagwatkar[15] for the synthesis of several 5, 6 and 7 membered nitrogen, nitrogen and sulphur containing heterocycles with several references to 1,2,4-triazioles, 1,3,5-thiadiazolidines, 1,3,5-dithiazines, 1,3,5-thiadiazines and s-triazines. These molecules possess various medicinal, agricultural, industrial and biochemical applications and importance, hence the present research scheme was designed to describe somewhat suitable and direct method for a synthesis of the novel (1,5-Diphenyl)-2,4-dithiobiurete.

Experimental

The melting points of all synthesized compounds were recorded using hot paraffin bath. The carbon and Hydrogen analysis was carried out on Carlo-Ebra 1106 analyzer. Nitrogen estimation was carried out n colman-N-analyzer-29. IR spectra were recorded on Perkin Elmer spectrometer n the range 40000-400 cm^{-1} in KBr pellets. PMR spectra were recorded on Brucker AC-300F spectrometer with TMS as internal standard using $CDCl_3$ and DMSO-d_6 as solvent. The Gel-G plates by TLC with layer thickness of 0.3 mm. All chemical used were of AR grades (India Made).

Synthesis of (1,5-Diphenyl)-2,4-dithiobiurete (3a):

(1,5-Diphenyl)-2,4-dithiobiurete **(3a)** was synthesized by refluxing the mixture of 1-phenylthiocarbamide **(1a)** with phenyl isothiocyanate **(2a)** in 1:1 molar proportion in acetone-ethanol medium for 4 hours on water bath, faint yellow coloured crystals were separated out. They were filtered and dried at room condition. Recrystalised from ethanol, Yield 85%.

"Efficient Synthesis and Antimicrobial Potential of N-Mannich Bases of 3, 4- Dihydropyrimidin-2-(1H)-ones Catalyzed by Cobalt Chloride Doped Polyaniline Composite"

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Abstract:

This study explores a novel, eco-friendly protocol for synthesizing N-Mannich bases of 3,4-dihydropyrimidin-2(1H)-ones using cobalt chloride doped polyaniline composite (Co-PANI) as a catalyst under solvent-free conditions. Employing the Biginelli reaction with aldehydes, alkyl acetoacetate, and urea or thiourea at 80°C, we demonstrate that Co-PANI catalysis yields high efficiency, mild reaction conditions, and excellent reusability, making it a cost-effective and environmentally benign option. The synthesized compounds were structurally characterized through spectroscopic techniques, and their antimicrobial efficacy was evaluated. Results indicate that these compounds exhibit significant activity against various bacterial strains. This method highlights the potential of Co-PANI as an effective, reusable catalyst, advancing sustainable practices in organic synthesis and offering promising antimicrobial applications for dihydropyrimidinones.

Keywords: N-Mannich Bases of DHPMs, biological activities, Biginelli reaction, MIC.

Introduction:

Pharmaceutical industries have shown a strong interest in multicomponent reactions, green chemistry approaches, and solvent-free synthesis methods for producing complex drugs. These methodologies are essential for exploring the molecular diversity involved in complex reactions, particularly with heterocyclic compounds [1-6]. Among these, the Biginelli synthesis stands out as a valuable multicomponent reaction in organic and medicinal chemistry, enabling the efficient production of multifunctional compounds, such as 3,4-dihydropyrimidin-2(1H)-ones and related heterocycles [7].

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MINERAL ANALYSIS OF MEDICINALLY IMPORTANT FERN: *ADIANTUM PHILIPPENSE* L.

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ABSTRACT

Phytochemical study of ferns has assumed an extraordinary importance due to its immense economic value especially their vast medicinal importance. *Adiantum philippense* is one the species of *Adiantum* which is highly medicinal used in various treatment. therefore in the present investigation attempts were made to study the mineral status of species collected from different areas of Northern Western Ghats of Maharashtra where it grows luxuriantly. The minerals status shows that, it contains sufficient macronutrients but differs seasonally. This may one of the reasons that species is used by the local practitioners as a medicine to cure various diseases.

Keywords: *Adiantum*, medicinal fern, Western Ghats of Maharashtra.

INTRODUCTION

The homosporous fern genus *Adiantum* L. of family Adiantaceae is one of the most common and widely distributed species all over India. It is commonly known as maidenhairs. Phytochemical studies of pteridophytic plants are important while evaluating plant wealth of any region. Phytochemical analysis has been done on large number of Indian fern and fern allies. But the majority of the reports pertain to quantitative estimation of primary metabolites which are universal in occurrence and are highly variable with the environment. They are important in ecophysiological studies (Khanna, 2002). It is also not possible to determine the source of any economically useful materials without any phytochemical study. The phytochemistry has been studied in less number of non-flowering plants in contrast to flowering plants. According to Joseph and Manickam (1993) no practical work has been done on the phytochemistry of ferns of Western Ghats. Therefore, it was thought worthwhile to carry out its mineral studies to investigate its nutritional status through its macronutrients analysis.

CROSSLINKED CHITOSAN-POLYVINYL ALCOHOL BLEND BEADS FOR REMOVAL AND RECOVERY OF Cr (II) FROM WASTEWATER

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ABSTRACT

Crosslinked chitosan/poly (vinyl alcohol) (PVA) blend aqueous solution was suspended in toluene-chlorobenzene to form droplets. Some of the water then distilled out as azeotropes with the aromatic hydrocarbons to reduce the water content of the suspension droplets. Glutaraldehyde was finally added to the suspension to result in the cross linked chitosan/PVA beads with low water content and high mechanical strength. In addition, prepared crosslinked beads were characterized by FTIR, X-ray diffraction (XRD), Scanning electron microscopy (SEM), and thermogravimetric analysis (TGA) the efficiency of crosslinked chitosan/PVA bended bead as an adsorbent for the removal of Cr (II)from water was studied. It was found to exhibit substantial adsorption capacity over a wide range of initial Cr (II) ion concentration. Effect of time, temperature pH, adsorbent dose and the concentration of adsorption of Cr (II) were investigated by batch process. Pseudo-first-order and pseudo-second-order model were evaluated. The kinetics data for the adsorption process follow the second order rate equation. The equilibrium studies data could be described well by the Langmuir and Freundlich isotherms. The thermodynamic parameters such as ΔG^0, ΔH^0, ΔS^0, are calculated. It was found that the values $\Delta H^0$and ΔS^0 increase while the values ΔG^0 decline with rise in temperature. Thus the adsorption process was found to be endothermic and spontaneous. The maximum adsorption Cr (II) ion (76.51%) in pH range 5-6 indicated that material could be effectively utilized for the removal of Cr (II) ion from waste water. The adsorption study showed 62% recovery of Cr (II), when 0.1 EDTA solutions were used as an effluent.

KEYWORDS: Chitosan/PVA beads, Adsorption, Cr(II)ion, Langmuir and Freundlich isotherms etc.

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RESEARCH PAPER

Chemical Synthesis and Characterization Study of Nanocrystalline and Coral Rock-Like Kasterite Cu_2ZnSnS_4 (CZTS) Thin Films

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Abstract: *The Cu_2ZnSnS_4 (CZTS) thin film is a newly emerging semiconductor material in the thin film solar cell industry. The CZTS is composed of economical, common earth-abundant elements. It has advantageous properties like a high absorption coefficient and the best band gap. Here we have applied a low-cost chemical bath deposition technique for the synthesis of CZTS at low temperature, acidic medium and its characterization. The films were characterized by different techniques like X-ray diffraction, Raman, SEM, Optical absorbance, electrical conductivity and PEC study. The X-ray diffraction and Raman scattering techniques were utilized for structural study. The XRD reveals the kasterite phase and nanocrystalline nature of CZTS thin films. These results and their purity were confirmed further by advanced Raman spectroscopy with a 335 cm^{-1} major peak. The crystallite size was found to be 50.19 nm. The optical absorbance study carried out by use of UV-visible spectroscopy analyses its band gap near about 1.5 eV and its direct type of absorption. The electrical conductivity technique gives a p-type of conductivity. The scanning electron microscopy (SEM) study finds its rock-like unique morphology. The EDS technique confirms its elemental composition and its fair stoichiometry. The analysis of PEC data revealed power conversion efficiency-PCE to 0.90%.*

Keywords: *Nanocrystalline, Semiconductor, Solar cells, Thin films, CZTS.*

1. INTRODUCTION

The whole world has been troubled by complicated environmental issues due to the enormous utilization of fossil fuels. To overcome increasing energy crises, solar energy is a more renewable option than any other limited resource. The solar energy is based on photovoltaic technology. The recent PV technology of thin film solar cells has excessively used silicon, cadmium telluride (CdTe) and copper indium gallium di-selenide (CIGS) as semiconductor materials. But these materials have severe limitations like high processing costs of silicon, composition of rare earth elements like In, Ga and toxicity of elements like Cadmium (Cd) [1, 2]. Hence these materials will not be helpful in future to satisfy ever-increasing energy requirements with a green environment approach.

The current PV technology needs semiconductor materials whose elements have a plentiful composition in the earth's crust which is helpful in the fabrication of low-cost and environmentally benign solar cells. In this regard, Cu_2ZnSnS_4 (CZTS) has been explored extensively as the environment's best promising absorber materials due to their excellent optoelectronic properties like band gap 1.5 eV and having as high as absorption coefficient over 10^4 cm^{-1} [3-4]. The CZTS is a p-type semiconductor material with a composition of ample and harmless elements. The CZTS has two primary structures kasterite and stannite type which have diverse arrangements of Cu^{1+} and Zn^{2+} atoms in the crystal structure [5]. However, Kasterite CZTS is thermodynamically more stable [6]. Overall CZTS is a substitute absorber material for the existing scenario of semiconductor material.

So far CZTS thin films have been prepared by several techniques such as RF magnetron sputtering deposition [7], thermal evaporation [8], atom electron-beam-evaporation [9], pulsed laser deposition [10], etc. but these vacuum methods are costlier due to its special requirements and high-temperature processes. Other non-vacuum methods involve sol-gel deposition [11], spray pyrolysis [12], chemical vapor deposition [13], spin coating technique [14], electrodeposition methods [15], nanoparticle methods [16], silar method [17] etc. To date, the solar cell based on

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REGULAR ARTICLE

An efficient and environmental friendly synthesis of 1*H*-pyrazolo[1,2-b]phthalazine-5,10-dione in aqueous hydrotropic medium

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Abstract. This study reports a hydrotropic activity for synthesizing 1*H*-pyrazolo[1,2-b]phthalazine-5,10-dione through one pot four component aldehyde condensation, malononitrile, phthalic anhydride, and hydrazine hydrate. The simple and green hydrotropic synthetic approach offers numerous advantages such as non-toxic, inexpensive, mild reaction conditions, avoidance of harmful solvents, shorter reaction time, an excellent yield of products, simple workup, Chromatography-free, and eco-friendly. ^{1}H-NMR confirmed all the synthesized compounds.

Keywords. Green chemistry; multi-component reactions; catalyst free; aqueous hydrotropic medium; heterocycles; room temperature; 1*H*-pyrazolo[1,2-b]phthalazine-5,10-dione.

1. Introduction

Multicomponent reactions (MCR) are pivotal in synthesizing heterocyclic compounds,[1–3] drawing researchers due to their numerous advantages in producing biologically and pharmaceutically active molecules from readily available starting materials. These reactions offer significant benefits such as accelerated reaction rates, reduced time consumption, and elimination of the need for extensive purification. Green solvents, crucial in sustainable methodologies, enhance these reactions particularly in aqueous conditions, ensuring eco-friendliness and abundance. Nitrogen-containing heterocyclic rings have garnered attention for their applications in biological, pharmaceutical, agrochemical, and functional materials.[4,5] Pyrazoles, notably central to many biologically active compounds like celecoxib, viagra, and pyrazofurine, are pivotal in drug development.[6–8]

Moreover, heterocycles containing the phthalazine moiety are particularly intriguing due to their demonstrated pharmacological and biological activities.[9,10] The 1*H*-pyrazolo[1,2-b]phthalazine-5,10-dione derivatives represent a unique class of heterocyclic frameworks with significant biological effects including antibacterial,[11] anticonvulsant,[12] cardiotonic,[13] vasorelaxant,[14] cytotoxic,[15] antimicrobial,[16] antifungal,[17] anticancer,[18] anti-inflammatory,[19] analgesic,[20] antihyperglycemic,[21] antihypoxic, antipyretic,[22] insecticidal, molluscicidal,[23] fungicidal,[24] and anti-HIV activities.[25] In recent years, these derivatives have gained increased attention due to their diverse and potent biological properties.

Various types of literature discuss the multicomponent synthesis of 1*H*-pyrazolo[1,2-b]phthalazine-5,10-dione. This compound is synthesized through a one-pot four-component reaction involving aromatic aldehyde, malononitrile, phthalic anhydride, and hydrazine hydrate, catalyzed by substances like N-methylimidazole,[26] $NiFe_2O_4$@B, N, F-tri doped CeO_2 (NFTDNC),[27] bovine serum albumin (BSA),[28] perlite NPs/SiO_2/guanidine,[29] poly(aniline-co-m-phenylenediamine),[30] water extract of papaya bark ash

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Okra peel-derived nitrogen-doped carbon dots: Eco-friendly synthesis and multi-functional applications in heavy metal ion sensing, nitro compound detection and environmental remediation

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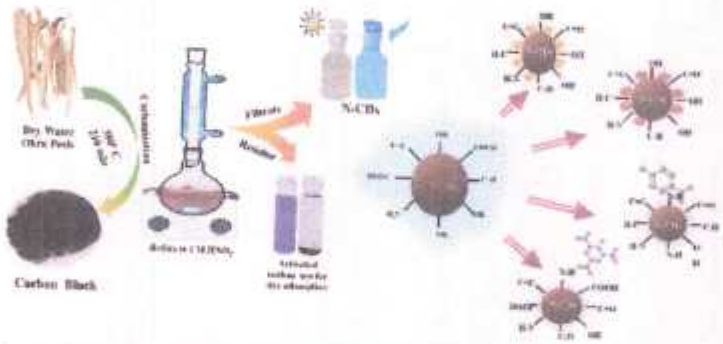
HIGHLIGHTS

- Kitchen waste okra peels derived synthesis of nitrogen doped carbon dots (N-CDs) as a fluorescent probe.
- N-CDs a fluorescent probe shows sensitivity towards Cr^{6+} and Mn^{7+} metal ions with instant decolourisation of Mn^{7+}.
- The developed fluorescent probe shows sensitivity and selectivity towards 4-nitroaniline (4-NA) and picric acid (PA).
- The developed method has good effectivity for real water sample with good recovery rate.
- The circular economy based reactivated carbon as an adsorbent for removal of model pollutant dyes.

GRAPHICAL ABSTRACT



ARTICLE INFO

Keywords:
Nitrogen doped carbon dots (N-CDs)
Fluorescence sensor
Fluorescence quenching
Emerging pollutant detection
Environmental remediation

ABSTRACT

The present study explores the kitchen waste okra peels derived synthesis of nitrogen doped carbon dots (N-CDs) via simple carbonization followed by reflux method. The synthesized N-CDs was characterized using, TEM, XPS, FTIR, XRD, Raman, UV–Visible and Fluorescence Spectroscopy. The N-CDs emits bright blue emission at 420 nm with 12 % of quantum yield as well as it follows excitation dependent emission. Further, the N-CDs were employed as a fluorescence sensor for detection of hazardous metal ions and nitro compounds. Among various metal ions and nitro compounds, the N-CDs shows fluorescence quenching response towards Cr^{6+}, and Mn^{7+} metal ions as well as 4-nitroaniline (4-NA) and picric acid (PA) with significant hypsochromic and bathochromic shift for Mn^{7+}, 4-NA and PA respectively. The developed fluorescent probe shows relatively low limit of detection (LOD) of 1.46 μg/mL, 1.05 μg/mL, 2.1 μg/mL and 2.2 μg/mL for the above analytes respectively. The N-CDs did not show any significant interference with coexisting ions and successfully applied for real water sample analysis. In addition, circular economy approach was employed for adsorption of dyes by reactivating leftover waste carbon residue which was obtained after reflux. Thus, the kitchen waste valorization and circular economy

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Original Article

QbD-Enhanced HPLC Method Development for Vildagliptin and Metformin HCl Formulations

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ABSTRACT

Objectives: This research employs the Quality by Design strategy to design an optimized High-Performance Liquid Chromatography method aimed at analyzing vildagliptin and metformin hydrochloride in pharmaceutical dosage forms. **Materials and Methods:** The mobile phases A and B comprised a buffer-acetonitrile mixture in ratios of 950:50 v/v and 600:400 v/v, respectively. Chromatographic separation was achieved using an YMC Triart C-18 column, with Vildagliptin detection conducted at 210 nm via UV absorbance. Various independent parameters were selected for investigation and risk assessment was employed to evaluate their impact on the analytical responses. **Results:** QbD prioritizes product understanding, risk management and process control to enhance quality assurance and regulatory tractability. Analytical Quality by Design principles ensure robust and flexible methods throughout the product lifecycle. **Conclusion:** This study developed a robust HPLC method for Vildagliptin using a Quality by Design (QbD) approach. Key factors like mobile phase composition and buffer pH were optimized through multivariate analysis. The resulting method, validated for accuracy, precision and robustness, outperformed traditional methods and is suitable for routine pharmaceutical analysis.

Keywords: HPLC method development, Metformin hydrochloride, Pharmaceutical dosage forms, Product understanding, Quality by Design, Risk management, Vildagliptin.

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INTRODUCTION

The current research work aims to utilize the QbD procedure for developing and optimizing a high performance LC technique for vildagliptin and metformin hydrochloride in a pharmaceutical dosage form. QbD is a methodical method improvement strategy that kicks off with predetermined goals and stresses a comprehensive consideration of both the product and the process. This involves prioritizing knowledge of products and manufacturing procedure, quality risk assessment and process rheostat, all based on thorough scientific principles.[1] By employing QbD principles, the primary goal is to ensure a higher level of confidence regarding product eminence, gain regulatory flexibility and continuously improve the method throughout its lifecycle. To achieve this, the foundation of the QbD method lies in implementing established guidelines, such as ICH Q8 Pharmaceutical Development, ICH Q9 Quality Risk Management and ICH Q10 Pharmaceutical Quality System.[2-4] In context of pharmaceutical product development, analytical science plays a critical role leading to the concept of analytical QbD. A scientific and risk-based approach for developing analytical methods is analytical QbD. Its objective is to recognizing predetermined goals and effectively drive critical essential scheme having properties that are affected by method variables. The end outcome of this strategy is improved method performance as well as high resilience, robustness and adaptability for ongoing expansion.[5,6] The application of AQbD leads to the establishment of a well-known, appropriate and reliable technique that consistently conveys the projected results over the entire product life span, analogous to the method QbD.[7,8] To make sure the technique is effective and reliable throughout the product's lifespan, it is crucial to assess the robustness and ruggedness of HPLC methods early in the method development stage for QbD. This proactive approach prevents the need for extensive redevelopment, revalidation and retransfer of analytical methods in the case of adopting a weak or unreliable system.[9] The primary vision of AQbD is to recognize potential drawback strategy and provide a reliable, operational design environment or design space while adhering to relevant

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Analytical Methods

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Sustainable synthesis of tunable emissive sulphur-doped CDs: a synergistic approach for metal ion sensing and antimicrobial applications†

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Over the last two decades, materials from the carbon family attracting increasing attention, carbon dots (CDs) have been synthesized *via* naturally or synthetically derived precursors, which are mostly limited to single fluorescence emission. Tunable emissive CDs have great importance in multiple applications. Therefore, in the present study, multi-emissive sulphur doped carbon dots (S-CDs) were synthesized using the leaves of *Nyctanthes arbor tristis*, commonly known as night-flowering jasmine (NFJ), as a precursor, by a simple acid carbonization method. Interestingly, different synthesis parameters were employed for tuning the optical properties of the S-CDs, of which the synthesis time played a vital role for tuning the fluorescence emission of the S-CDs. Bright blue (BB-CDs), yellow (Y-CDs), and cyan blue (CB-CDs) fluorescence emissions with reaction times of 1, 6, and 8 h were observed. These three CDs have emission ranges of 391, 661 and 408 nm with corresponding quantum yields of 38.96, 6.59, and 25.06%, respectively. The structural and functional morphology of all three S-CDs were analyzed using various characterization techniques. S-CDs showed both excitation dependent (BB-CDs, CB-CDs) and independent (Y-CDs) emission behavior with good photo and pH stability. Furthermore, all the S-CDs were utilized as fluorescent probes for the detection of metal ions, and BB-CDs selectively detect Fe^{3+}, Y-CDs detect $Cr^{6+}$and Mn^{7+}, and CB-CDs detect Cr^{6+} and Fe^{3+}ions with corresponding LODs of 0.1, 1.66, 0.96, 2.18 and 1.56 μg mL^{-1}, respectively. The static quenching mechanism was observed for BB-CDs and CB-CDs, while in the case of YB-CDs, Cr^{6+} shows the dynamic quenching mechanism. In addition, the antibacterial behavior of all three S-CDs was analyzed against *S. aureus* and *K. pneumoniae* (Gram positive and Gram negative) bacteria. These S-CDs show good potential in metal ion sensing in environmental water samples and biological activity.

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1 Introduction

Tunable emissive carbon dots (CDs) have attracted much attention owing to their excellent properties, such as high water solubility, excellent biocompatibility, low toxicity, facile synthesis and ease of surface functionalization.[1–4] CDs have been applied for various applications such as fluorescence sensing, bio-imaging, anti-counterfeiting, drug delivery, photothermal therapy (PTT), LEDs, bone tissue engineering and many more.[5–8] Therefore, CDs have generated broad interdisciplinary research interest in materials science, biology, medicines and core chemistry.[7,9,10] Owing to their outstanding advantages, CDs have been regarded as a new generation of fluorescent materials. The tunable fluorescence behavior of CDs is one of their outstanding properties. Over previous years, many reports have demonstrated the multicolor photoluminescence (PL) behavior of CDs upon varying their physical and chemical parameters. Iyer *et al.* have synthesized CDs with emission in the blue and green regions *via* a hydrothermal and microwave method using orange peel biomass as a carbon precursor.[11] In another report, Wang *et al.* experimented on spinach with water, acetone and ethanol as a solvent to achieve blue, red and greyish white luminescent CDs.[12] Similarly, researchers have achieved multicolor CDs by optimizing different parameters, such as the selection of the precursor, synthesis method, heteroatom/metal ion doping and solvents.[13–15] However, it is still a challenge to obtain multicolor CDs in one synthesis method with one precursor.

The synthesis of CDs can be achieved by both top-down and bottom-up approaches. Several bottom-up methods such as hydrothermal, microwave irradiation, thermal decomposition

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Activated carbon from pencil peel waste for effective removal of cationic crystal violet dye from aqueous solutions

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ARTICLE INFO

Keywords:
Pencil peel based activated carbon
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ABSTRACT

In this investigation, the pencil peel (PP) is utilized as a scavenger for adsorptive removal of crystal violet (CV) dye. Pencil peel activated carbon (PPAC) is produced through a straightforward physical activation method by annealing pencil peel in a muffle furnace at 300 °C. The prepared PPAC shows the mesoporous nature having specific surface area of 217.44 $m^2 g^{-1}$. The highest uptake of CV dye was observed at equilibrium as working solution pH-8.0, CV dye concentration-100 mg L^{-1}, the PPAC dosage-0.25 g at 200 rpm speed. The observed experimental results align with the Freundlich adsorption isotherm model, suggesting of multilayer adsorption. The kinetic study attributes the uptake rate adheres to the pseudo-second-order kinetic rate model (regression coefficient, $R^2 = 0.99$).

1. Introduction

Water pollution constitutes a significant environmental challenge faced by developing nations. One of the major contributors to this issue is the textile industry [1]. Various processes in the textile industry, such as fiber production, sizing, desizing, scouring, bleaching, and dying, require considerable water [2]. The liquid waste generated from these processes is often contaminated with toxic substances including synthetic dye and heavy metals [3]. The application of synthetic dyes extends beyond the textile sector, encompassing various industries such as leather processing, paper production, plastics manufacturing, and pharmaceutical development. The global annual production of dyes exceeds 7×10^8 Kg [4]. Consequently, industrial effluents often contain high concentrations of artificial dyes, which are commonly released into aquatic ecosystems without adequate treatment. Water pollution caused by synthetic dyes from different industries presents a significant environmental and health hazard, endangering both aquatic ecosystems and human well-being [5,6]. Artificial dyes, even in trace amounts, can pose significant risks to environmental well-being. Due to their ability to withstand high temperatures, oxidation, and exposure to light.

Crystal violet (CV), a cationic dye is frequently utilized in textile manufacturing as a coloring agent. Its widespread use can be attributed to its accessibility, high performance, and cost-effectiveness [7]. The toxic effects of CV dye on both aquatic and land-based organisms are long-lasting, as it remains in the environment for extended periods. The use of CV dye has been shown to affect human health negatively, causing various symptoms and conditions. These adverse effects include elevated heart rate, feelings of sickness, circulatory collapse, bluish skin discoloration, yellowing of the skin and eyes, paralysis of all four limbs, and death of body tissues [8,9]. In severe situations, it can cause respiratory and renal failure as well as permanent corneal and conjunctival damage [10]. Nowadays the mitigation of such dyes is considered a burning research area [11] therefore there is an urgent need for decontamination from the aqueous stream. To address this concern, the adsorption technique is employed as an inexpensive, easy for handling waste to useful strategy. In literature, various methods are reported for water purification such as photocatalysis [12,13], solvent extraction [14], adsorption [15], flocculation/coagulation [16], ozonation [17], ion exchange [18], membrane filtration [19], electrochemical destruction [20]. Adsorption is considered a highly adaptable method for treating wastewater [21,22] owing to voluminous adsorbent material like natural material to synthetic lab-prepared materials as well as it has

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Ultra-probe sonication assisted greener approach in aqueous hydrotropic media for the synthesis of pyranopyrazole derivatives

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Abstract

In this study, we report a simple, green, effective, and enhanced method for synthesizing pyranopyrazole from four-component condensation of aldehyde, malononitrile, ethyl aceto-acetate, and hydrazine hydrate employing four components in one pot that is multicomponent reactions (MCRs). Multicomponent reactions carried out by using a universal solvent; water has a quality position in organic and green synthesis. By using an aqueous hydrotropic solution and ultra-probe sonication, raising the rate of reaction and getting an excellent yield are the main features of this article. Key features of the current practice include the use of non-hazardous reaction conditions, operational simplicity, and the use of cost-effective initiating substances. The pure product can be isolated easily through simple filtration, eliminating the need for column chromatography. The process yields excellent results and is time-efficient. Additionally, the hydrotrope can be recycled up to five times without significant loss of activity, making it highly beneficial for meeting industrial needs and addressing environmental concerns.

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RESEARCH

Porous structure of Fe_2O_3 thin films prepared for supercapacitors via CBD method: effect of molar concentration

A. A. Admuthe[1] · P. A. Desai[2] · S. G. Pawar[3] · S. L. Jadhav[4] · A. L. Jadhav[4] · D. B. Malavekar[5] · N. S. Bachankar[5] · J. H. Kim[5] · K. V. Gaikwad[6] · V. S. Jamadade[1]

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Abstract
In present study, iron oxide (Fe_2O_3) thin films were fabricated using a simple chemical bath deposition method, and the effect of precursor concentration (0.05 M, 0.1 M and 0.15 M) on the electrochemical properties was investigated. The X-ray diffraction analysis confirmed that the hematite (Fe_2O_3) phase of material, while water contact angle measurements revealed a hydrophilic nature. The scanning electron microscopy images exhibited a random distribution of porous structures, with a uniform coating and rough grain morphology. The energy-dispersive X-ray spectroscopy further confirmed the presence of iron (Fe) and oxygen (O) elements in the films. Brunauer–Emmett–Teller (BET) surface area analysis showed 41.19 $m^2 g^{-1}$ of specific surface area for Fe_2O_3 thin film deposited using 0.15 M precursor. The electrochemical performance of the films was evaluated for charge storage applications, with cyclic voltammetry revealing a high specific capacitance of 495 F g^{-1} at a scan rate of 5 mV s^{-1} for 0.15 M precursor concentration in 1 M NaOH electrolyte. Galvanostatic charge–discharge measurements confirmed a specific capacitance of 337 F g^{-1} at a current density of 3.1 A g^{-1}. These findings suggest that Fe_2O_3 thin films deposited at optimized concentration of iron precursor exhibit significant potential as candidates for supercapacitor applications.

Keywords Iron oxide · Chemical bath deposition · Energy storage · Specific capacitance · Supercapacitor

Introduction

The demand for energy has significantly increased due to the advancement of humanity. However, conventional energy production methods are contributing to serious environmental challenges and climate change. The growing urgency for clean and sustainable energy sources can only be addressed through the utilization of renewable energy. Despite this, certain renewable energy sources are intermittent, which poses a challenge to their reliability over extended period [1]. It is crucial to develop renewable, non-conventional energy sources and establish an efficient energy storage system that can operate coherently. In other words, there is a need to transition from traditional, reliable energy collectors to more efficient, rapid and sustainable power storage solutions. Energy storage is becoming a more important research topic in the present work [2, 3]. The fabrication and synthesis of suitable materials exhibiting high power density and charge/discharge rate in addition to the longer life cycle and environmental favourable are the current research focus among material scientists [4, 5]. Also, Supercapacitors have gained significant attention due to their advantages, including portability, lightweight design, rapid charging capabilities, and high cyclic stability [6, 7]. Given these advantages, extensive research has been dedicated to the development

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The chapter-I introduces nitrogen and oxygen-containing heterocycles, emphasizing their importance in medicinal chemistry, materials science, and agriculture. Compounds like imidazopyridines and oxadiazoles are highlighted for their versatile biological activities, including antimicrobial, antiviral, and anticancer properties, making them valuable scaffolds in drug development. The chapter -II focused on the synthesis and antibacterial studies of imidazopyridinyl-1,3,4-oxadiazoles, this chapter details environmentally friendly and efficient methods for their preparation. The synthesized compounds demonstrate significant antibacterial activity, establishing them as potential candidates for novel antimicrobial therapies against pathogenic micro-organisms. The chapter-III explores a microwave-assisted approach for synthesizing trifluoromethyl-1,2,4-oxadiazoles (TFMO). The method adheres to green chemistry principles by reducing reaction times and increasing yields. TFMO derivatives, known for their unique physicochemical properties, are shown to have promising applications in pharmaceuticals and agrochemicals, highlighting their practical relevance.

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Pravina Piste, Umesh Shelke, Kishor Gaikwad

Pravina Piste
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Kishor Gaikwad

Exploring Nitrogen and Oxygen Heterocycles: Chemistry and Applications

Heterocyclic Chemistry: Focus on Nitrogen and Oxygen-Containing Compounds

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EPIPHYTIC PTERIDOPHYTES OF ARUNACHAL PRADESH (INDIA)

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ABSTRACT

Arunachal Pradesh is the most North-easterly state of India, with Bhutan to the West, Myanmar to the East, Tibet to the North and Assam in the South. Pteridophytes represent a diverse group of plants which forms an interesting and conspicuous part of the forest ecosystem. The present research studies the species diversity and composition of epiphytic ferns and fern allies from Arunachal Pradesh. Polypodiaceae is the most dominant and diverse followed by Pteridaceae. The number of species was plotted against different altitudinal gradients which resulted in hump-shaped species distribution pattern. Maximum number of species richness was recorded from the mid-altitudinal range. Results show that bigger host trees having rough bark texture generally sheltered maximum species compared to trees having smooth bark. Additionally, the life form and threat status of fern and fern allies have also been assessed.

Keywords. ***Polypodiaceae, Epiphytic ferns, Habitat, Altitude,***

INTRODUCTION

Pteridophytes represent a diverse group of plants which forms an interesting and conspicuous part of the forest ecosystem. Epiphytic ferns are mostly occur in the tropics and they are necessary and fragile members of humid forests, such that their diversity can be seriously affected by any form of disruption in the forests (Hietz *et al.*, 2006). The pteridophytes perform several critical ecological functions as indicator plants for habitat loss and fragmentation (Silva *et al.*, 2018), improving soil conditions (Walker, 1994) and also in removing inaccessible arsenic from mined wastelands (Tu and Ma, 2005). Furthermore, they are known to adapt to various disturbances and accumulate toxins from the environment (Mehltreter *et al.*, 2010). Normally, epiphytic fern diversity is higher in the primary forest than in disrupted habitats (Hickey, 1994). In this context, the present study examines the species diversity and composition of epiphytic ferns and fern allies in Arunachal Pradesh. The high rainfall in Arunachal Pradesh, the most Northerly occurrence in

On Wavelet Transform as an Extension of Fractional Fourier Transform and its Applications

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Abstract:

Wavelet theory is associated with building a model for a signal, system or processes with a set of special signals and is emerged as a powerful tool of signal denoising.The main objective of this paper is to study the wavelet transform as an fractional Fourier transform (FrFT) and its some basic properties. Applications of the extended wavelet in solving generalized nth order linear nonhomogeneous ordinary differential equations. Also gives applications in signal processing and convolution of mother wavelet and Mexican Hat Wavelet.

Keywords: fractional Fourier transform, wavelet transform, signal processing

Introduction:

The theory of fractional Fourier transforms (FRFTs) has advanced considerably since its inception, largely driven by the need to extend the classical Fourier transform for diverse applications in optics, signal processing, and quantum mechanics.[10] A core tool involves the Fourier domain computation of an approximate digital random transform. The Fractional Fourier Transform (FrFT), a generalization of the Fourier Transform (FT), depends on a parameter α, which corresponds to the angle in the phase plane [1]. Curvelet transforms exploit sparsity and have found numerous applications [3,4]. The wavelet transform is a powerful tool for multi-scale geometric image analysis [7]. It decomposes a signal into a representation that reveals signal details as a function of time. Traditionally, the wavelet transform and the Fractional Fourier Transform (FrFT) have been widely used in signal and image processing. Wavelet transforms, as extensions of the FrFT, have proven valuable in solving ordinary and partial differential equations, such as the heat equation and the Schrödinger equation [9]. Wavelet-based multi-resolution techniques have been extensively applied in various fields, including signal and image processing, bioinformatics, computer vision, scientific computing, and optical data analysis[6]. The FrFT has also shown significant utility in addressing certain problems in quantum physics. The growing interest of

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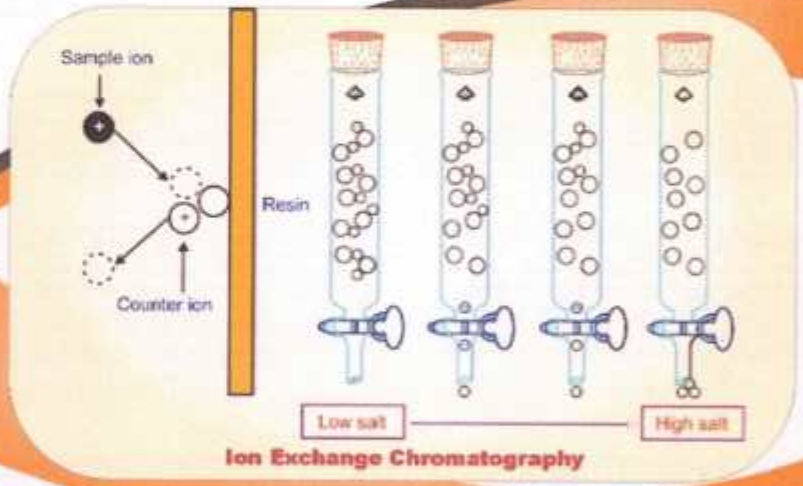

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Prof. (Dr.) ARJUN S. KUMBHAR
Prof. (Dr.) DNYANDEV N. ZAMBARE
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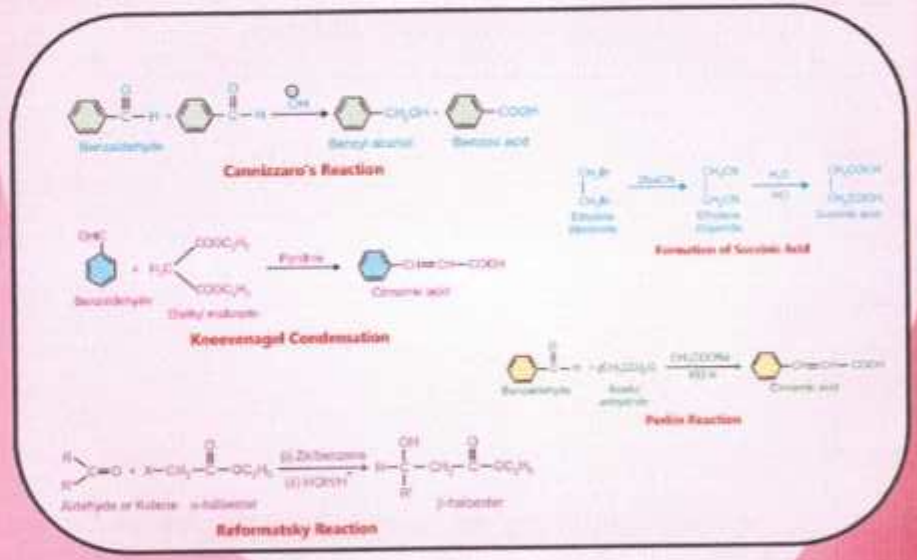

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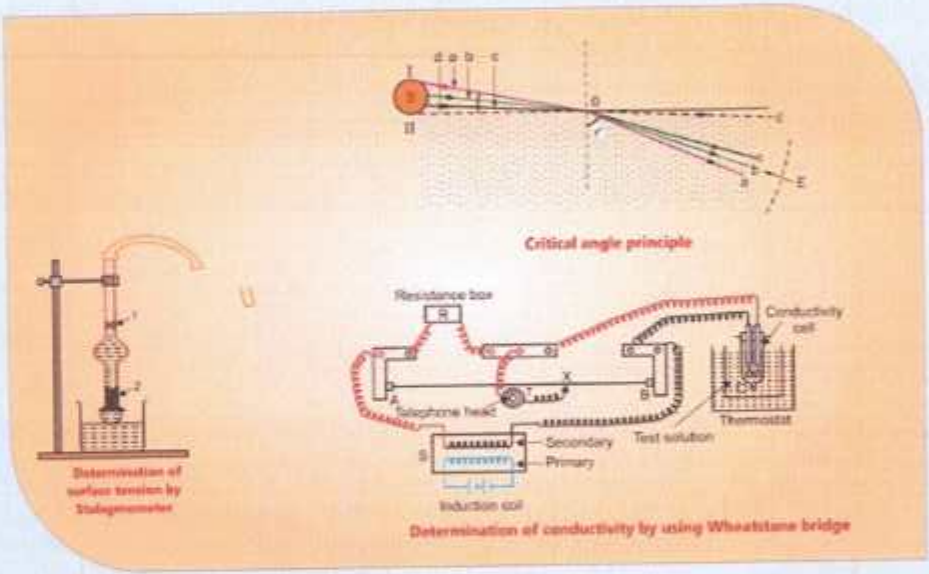

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