



SGBAU sponsored
National Conference on
Advances in Biodiversity Conservation
& Sustainable Development :
Educational & Scientific Research Perspective
March 3 - 4, 2023

Souvenir



शतकोत्तर
रौप्य 125
महोत्सव वर्ष

भारताचे प्रथम कृषिमंत्री,
कृषिरत्न, शिक्षण महर्षी

डॉ. पंजाबराव उपाख्य
भाऊसाहेब देशमुख

शतकोत्तर रौप्य महोत्सवी
जयंतीवर्ष पर्व उपक्रम
शृंखलेतील समर्पित पुष्प



- Organized by -

Departments of Life Sciences

Shri Shivaji Science College, Amravati

Shivaji Nagar, Morshi Road, Amravati (MS) India - 444 603



In collaboration with



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Prithivya
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SHRI SHIVAJI SCIENCE COLLEGE, AMRAVATI

NAAC Accredited by Grade "A+" with CGPA of 3.42 (IV Cycle)
UGC Awarded Status of CPE (II Phase)

Identified by DST, Government of India for FIST, SGBAU-Lead College,
ISO 9001 : 2015 Certified College & nirf-2022 Rank Band : 151 - 200

shivajiscamt.office@gmail.com 0721-2660855 / 2665485

Salient Features

Curricular Aspects

B.Sc.

Thirteen Combinations (Botany, Chemistry, Computer Science, Geology, Environmental Science, Mathematics, Microbiology, Physics, Statistics, Vocational Biotechnology, Vocational Computer Application, Zoology)

B.C.A.

(Bachelor of Computer Application)

M.Sc.

Botany, Chemistry, Computer Software, Physics, Zoology, Bioinformatics & Environmental Science, Mathematics & Microbiology

UGC Sponsored Innovative Course

P.G. Diploma in Ground Water Exploration & Water Shed Management.

P.G. Diploma in content writing and cyber security, 29 add-on/value added courses

Career Oriented Program (UGC)

- Cosmetology • Clinical Laboratory Technology • Modern Horticulture & Landscaping
- Astronomy & Astrophysics • Eco-Tourism & Wild Life Photography

Research

- Botany • Chemistry • Environmental Science • Geology • Mathematics
- Microbiology • Physics • Statistics • Zoology

Infrastructure Facilities

- Separate UG, PG & Research Labs with State of Art Facility
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Sports Facilities

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- Net Ball • Volley Ball • Hand Ball • Ball Badminton • Dodge Ball

Best Practices

- Science Innovation Activity Centre • Continuous Ambient Air Quality Monitoring Station
- Guardian Teachers Scheme • Academic Audit • Dress Code • Campus Monitoring
- Students Representative on Important College Committees • IQAC Newsletter

Ambiance Learning Environment

- Lush Green Garden / Lawns • Eye Catching Landscaping • Medical Park with Poly Net House.



Hon'ble Harshvardhan P. Deshmukh

President, Shri Shivaji Education Society, Amravati

Dr. G. V. Korpe

Principal, Shri Shivaji Science College, Amravati



SGBAU Sponsored



Educational & Scientific Research Perspective

**National Conference on
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& Sustainable Development :
Educational & Scientific Research Perspective
March 3 - 4, 2023**

- Organized by -

**Departments of Life Sciences
Shri Shivaji Science College, Amravati**

Shivaji Nagar, Morshi Road, Amravati (MS) India - 444 603

- Editors -

Dr. D. D. Khedkar

Dr. S. P. Ingole

Dr. T. B. Wankhade

Dr. G. B. Hedawoo

Dr. A. R. Rajoria

Dr. A. S. Tekade



In collaboration with



Melghat Tiger Reserve,
Amravati



Microbiologist
Society,
India



International
Journal of
Life Sciences

OUR VISION

"Now here, you see, it takes all the running you can do, to keep in the same If you want to get somewhere else, you must run at least twice as fast as twice" (The Red Queen to Alice in Through the Looking Glass by Lewis Carroll)

The domains of academia have opened up and strong market winds have begun to blow through its portals Foreign universities are entering in droves and private business houses are at their drawing boards, planning out strategies to enter the education market in a big way. Critics may carp at what they call the commercialization of education, but pragmatists know that with India joining the world full steam, you either raise the bar or perish.

We have always believed in raising the bar. All minds were put together and as a result we have been following a major year-by-year road-map up to 2015. We have high quality assets with us in our teachers, a supportive parent society, a good infra-structure and a reputation that takes an age to build. We have been putting these assets to use in an annually distributed pattern to upgrade ourselves in the following areas:

- 1) Academic Improvements
- 2) Strengthening of Laboratories.
- 3) Promotion & use of I.C.T. in teaching and learning Process.
- 4) E-content development.
- 5) Establishment of Central Instrumentation facility.
- 6) Establishment of Study Centre.
- 7) E-governance promotion.

Our Vision for the betterment of the institution, welfare of the students

OUR MISSION

Our mission was spelt out long ago by the founder of the Shri. Shivaji Education Society, Bhausaheb Dr. Panjabrao Deshmukh. "Let us work hard", he had said, "for the comprehension of scientific facts for the greatest good of the country. We shall bridge the wide gap that exists between the laboratories and the fields." The farmer, for Bhausaheb, was the visible face for the destitute, unprivileged Indian who toiled on the farms and in the factories. Sunk in superstition, the peasant carried the burden of an exploitative society on his trail shoulders.

Our mission, then, is to provide strength to the arms and mind of this Indian with the transforming force of education, to create a scientific temper which kills fear and quickens curiosity. We are alert to the double-edged nature of youthful energy, and are committed to harness their boundless enthusiasm and creativity for the mammoth task of nation building. We are mission mode. and have created a facility for achieving excellence in education through the application of basic science and state-of-the-art technologies. We are committed to encourage research and to upgrade our tools, and to place our society at the supremely progressive position.

Our Inspiration



Dr. Panjabrao Alias Bhausaheb Deshmukh

Founder President

**Shri Shivaji Education Society, Amravati
and Ex. Agriculture Minister (Govt. of India)**



Shri Shivaji Education Society Amravati's
Shri Shivaji Science College, Amravati
NAAC - "A" Grade, A UGC - CPE, NIRF Rankband 150-200
DST - FIST, SGBAU - Lead College



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Food for the Hungry

Water for the Thirsty

Clothes for the Naked

Education for the Poor

Shelter for the Homeless

Medicines treatment for the Sick

Employment for the Jobless

Protection for the Animals

**Marriage Opportunity for the Poor
Girls and Boys**

Courage for the Unhappy & Frustrated

Dynamic Leadership



Shri Harshavardhan P. Deshmukh

President

Shri Shivaji Education Society, Amravati

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Shri Shivaji Education Society, Amravati



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National Conference on
Advances in Biodiversity Conservation & Sustainable Development :
Educational & Scientific Research Perspective

March 3 - 4, 2023

- Organized by -

Department of Life Sciences
Shri Shivaji Science College, Amravati

National Advisory Committee

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ACKNOWLEDGMENTS

The organizing committee of National Conference on
Advances in Biodiversity Conservation & Sustainable Development :
Educational & Scientific Research Perspective
NCABCSD-2023 express their sincere thanks to the following Funding Agencies / Firms
or Organizations for their benevolent gesture by financially helping us to
conduct the function in a grand way.

- **Geo-Tech, GIS training Institute and Consultancy**
- **Shri Shivaji college of Agri. Biotechnology, Amravati**
- **Shri Pundlik Maharaj Mahavidyalaya, Nandura (Rly) Dist. Buldana**
- **Shri Shivaji College of Horticulture, Amravati**
- **Sipna College of Engineering and Technology, Amravati**
- **Core project**
- **Simpak IT Pvt. Ltd., Gandhi Chowk, Amravati**
- **Labline Instruments (India) Pvt. Ltd.**
- **Rajshree Tyres and services C/O Ajmera Tyres Pvt. Ltd**
- **Universal Traders, Amravati**
- **Shri Gurudev Printers, Amravati**
- **Ganesha Scientific**

Messages



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Messages



Hon'ble Shri. Harshvardhanji Deshmukh

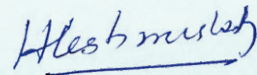
President

Shri Shivaji Education Society

Shivaji Nagar, Amravati, MS, India

Immense is my pleasure to learn that Shri Shivaji Science College, Amravati, one of the premier centres of Science learning in the region, is organising a **National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023**. Having a number of precedents in the organisation of such academic events of this magnitude in the past, it is too heart-warming to note that, in an era of computers and other technological advancements, when Environmental and Ecological with aspects of Biodiversity Conservation and Sustainable development issues are being relegated to the background, Shri Shivaji Science College is venturing to fetch these topics to the limelight. Sensing the urgent need of the hour, our Science college has rightly chosen the subject of Biodiversity Conservation and Sustainable development while keeping Educational and Scientific research perspective.

On this great mega event, I congratulate the organizers and convey my warm greetings to all the delegates came from all over India and wish pleasant & fruitful deliberation ahead.



(Shri. Harshvardhan P. Deshmukh)

Messages



Hon'ble Dr. Pramod Yeole

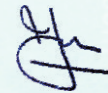
Vice- Chancellor

Sant Gadge Baba Amravati University, MS, India

Its matter of pleasure for me to note that Shri Shivaji Science College, Amravati is organizing a National Conference “**Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)**” during **March-3 & 4, 2023**. This joint venture with Sant Gadge Baba Amravati University, Amravati and Shri Shivaji Science College will certainly launch a wave of Biodiversity Conservation and Sustainable development as well as Educational and Scientific research in entire Maharashtra.

The scientific deliberations during conference amongst researchers and the stalwart scientists from reputed research institutes of India will touch every corner of science through interdisciplinary studies. Hope to have a fruitful discussion and conclusions as a resolution of the conference.

I wish every success in this endeavour.



(Dr. Pramod Yeole)

Messages



Dr. Prasad Wadegaonkar

Pro-Vice- Chancellor

Sant Gadge Baba Amravati University, MS, India

Immense is my pleasure to learn that Shri Shivaji Science College, Amravati, one of the premier centres of Science learning in the region, is organising a **National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023**. Having a number of precedents in the organisation of such academic events of this magnitude in the past, it is too heart-warming to note that, in an era of computers and other technological advancements, when Environmental and Ecological with aspects of Biodiversity Conservation and Sustainable development issues are being relegated to the background, Shri Shivaji Science College is venturing to fetch these topics to the limelight. Sensing the urgent need of the hour, our Science college has rightly chosen the subject of Biodiversity Conservation and Sustainable development while keeping Educational and Scientific research perspective.

On this great mega event, I congratulate the organizers and convey my warm greetings to all the delegates came from all over India and wish pleasant & fruitful deliberation ahead.

(Dr. Prasad Wadegaonkar)

Messages



Hon. Sau. Sulbhatai Khodke
MLA
Amravati

It makes me delighted to know that a National Conference on **“Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)”** during March-3 & 4, 2023 is organized at Amravati, the Central place of Vidarbha. Shri Shivaji Science College, Amravati is well known to pioneer academic programs for emancipation of rural as well as urban population. The sharing of the responsibility by SantGadge Baba Amravati University, Amravati will also add flavor to the intellectual deliberation.

It's now need of an hour to have integrative work in the field of Biodiversity conservation & Sustainable Development keeping Educational & Scientific research Perspective. Participation of researchers from different areas of knowledge in conference will definitely serve the purpose. I appreciate an initiative, vision and scientific approach planned by organizing committee while including almost all contributing subjects under the conference themes.

I convey my sincere wishes and commitment towards successful and fruitful summit ahead.

Kind regards.

A handwritten signature in black ink, appearing to read 'Sulbhatai Khodke', with a horizontal line underneath.

(Sau. Sulbhatai Khodke)

Messages



भारत सरकार
GOVERNMENT OF INDIA

पर्यावरण, वन एवं, जलवायु परिवर्तन मंत्रालय
Ministry of Environment, Forest and Climate Change

Dr. Basudev Tripathy
Scientist- E & Officer-in-Charge



It is my privilege to inaugurate the event and deliver the Keynote Address on the occasion of **National Conference on "Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCS-2023)"** being organized by the Department of Life Sciences, Shri Shivaji Science College, Amravati from 3rd March – 4th March, 2023.

I congratulate the Organizers and envisage the conference of this nature will not only create a platform for the participants to share and exchange their academic intellect of their respective working fields but will also encourage our academia and researchers to plan and execute multifaceted projects in benefiting our society through scientific intervention.

My best wishes for the Conference.



(Dr. Basudev Tripathy)

प्रभासी अधिकारी
Officer-In-Charge
भारतीय प्राणी सर्वेक्षण
ZOOLOGICAL SURVEY OF INDIA
पश्चिमी प्रादेशिक केंद्र
Western Regional Centre
पुणे/ Pune-411044

Messages



Dr. Vijay Govindrao Thakare

Secretary

Shri Shivaji Education Society

Shivaji Nagar, Amravati, MS, India

Its great privilege and I feel delighted to note that Shri Shivaji Science College, Amravati and Sant Gadge Baba Amravati University, Amravati is jointly organizing a **National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023**. While conveying my deep sense of appreciation over the organisation of a conference of this nature, I am assured that the scientific deliberations planned during 3rd and 4th March, 2023 will certainly torch our academia and researchers to plan and execute multifaceted projects in benefit of our society.

I congratulate organizers and convey my best wishes.



(Dr. Vijay Govindrao Thakare)

Messages



Dr. Tushar Deshmukh

Registrar

Sant Gadge Baba Amravati University, MS, India

Its matter of pleasure for me to note that Shri Shivaji Science College, Amravati is organizing a **National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023.**

Such a Conference provides an ideal platform for students, academicians and researchers from various parts of India to boost their knowledge and I hope that this conference will enlighten the current issues in the vital subject.

I wish every success in this endeavour.



(Dr. Tushar Deshmukh)

Messages



Dr. Sanjay Dudul

Dean, Faculty of Science

Sant Gadge Baba Amravati University, MS, India

I am pleased to know that Department of Life Sciences of Shri Shivaji Science College, Amravati is organising a National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023. I congratulate and felicitate the institute, Faculty and Researchers on this occasion.

The national conference should serve as a platform for exchange views and experiences as well as a forum for sharing of knowledge Biodiversity, its conservation, sustainable development with respect to Educational and scientific research perspective. I hope that the delegates, who are specialized in diverse fields of Life Sciences, will also interact on current problems being encountered by them in their respective fields.

I wish this National Conference all success.

With Good Wishes.



(Dr. Sanjay Dudul)

Messages



Dr. K. M. Kulkarni

Ex- Director, Higher Education &
Former VC, SRTMU, Nanded

Moment of Pleasure to know that Department of Life Sciences of Shri Shivaji Science College, Amravati is organising a National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023. I congratulate and felicitate the institute, Faculty and Researchers on this occasion.

This national conference would definitely serve as a medium to merge and unify the knowledge of Biodiversity, its conservation, sustainable development with respect to Educational and scientific research perspective as well as exchange and share views and experiences of all the active participants and specialized delegates in their diverse fields of Life Sciences.

I wish this National Conference all success.

With Good Wishes.

A handwritten signature in black ink, appearing to read 'Dr. K. M. Kulkarni', written in a cursive style.

(Dr. K. M. Kulkarni)

Messages



Shri Kishor Rithe

Honorary Secretary,
BNHS, Mumbai

It's a moment of great pleasure for me to know that Department of Life Sciences of Shri. Shivaji Science College, Amravati is organising a National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during 3rd and 4th March, 2023.

This conference will definitely help delegates, scientists, research scholars and student participants to build their understanding in the inter-disciplinary subjects covered in the conference.

I appreciate and congratulate the organizers for this conference and extend the warm wishes.

Kind regards,

A handwritten signature in black ink that reads "Kishor Rithe".

(Shri Kishor Rithe)

Messages



Dr. Jayoti Banerjee

CCF,

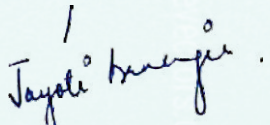
Melghata Tiger Reserve, Amravati

Very happy to be a collaborator of this 2 Days National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” with Department of Life Sciences of Shri Shivaji Science College, Amravati which is scheduled on 3rd and 4th March, 2023.

This conference will definitely help to bridge the gaps by sharing of knowledge by resourceful delegates, scientists, and active research scholars and student participants who are working in their respective fields of Life sciences.

I appreciate and convey my sincere wishes.

Best wishes.


(Dr. Jayoti Banerjee)

From the desk of Principal



Dr. G. V. Korpe

Principal

Shri Shivaji Science College

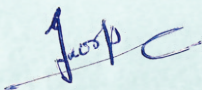
Shivaji Nagar, Amravati, MS, India

The acute need to provide a National dais for the discussion of the issues related to Ecology, Environment, Biodiversity, Sustainable development, therefore department of Life Sciences of Shri Shivaji Science College, Amravati is organising a National Conference on “Advances in Biodiversity Conservation & Sustainable Development: Educational & Scientific research Perspective (NCABCSD-2023)” during March-3 & 4, 2023.

It's now need of the hour to have integrative work in these inter-disciplinary fields to come up with fruitful results to make India independent quality and quantity wise. Participation of researchers from different areas of knowledge in conference will definitely serve the purpose. I appreciate this initiative, vision and scientific approach planned by organizing committee while including almost all contributing subjects under the conference themes.

I convey my sincere wishes and commitment towards successful and fruitful summit ahead.

Kind regards.


(Dr. G. V. Korpe)

From the desk of Convener



Dr. J. D. Dhote

Convener, NCABCSD-2023 &
Professor & Head, Deptt. of Zoology
Shri Shivaji Science College
Shivaji Nagar, Amravati, MS, India

India is one of seventeen megadiverse countries. It overall constitutes 8.2% of World's Biodiversity including both latitudinal and longitudinal gradients of Biodiversity. Besides this, there are 4 Biodiversity hotspots of India which constitute the rich fauna & floral diversity. Therefore, Biodiversity conservation should be promoted with Sustainable development and this 2 Days National Conference is entitled keeping in mind the need of the hour as “Advances in Biodiversity Conservation and Sustainable Development: Educational and Scientific Research Perspective” organized by Department of Life Sciences, Shri Shivaji Science College, Amravati which is to be held on 3rd and 4th March, 2023. This National Conference is aimed to provide a platform to academicians, researchers, managers, policymakers and other groups of scientific community, who are active in the related areas and to give them a forum for exchanging information through the presentation and discussion of papers dealing with wide variety of related topics. It is expected that participants in research should reflect the diversity of our resources taking into account of the richness and evenness of India's Flora and Fauna. This National Conference is also focusing on to make all the recommendations to priorities in the areas of biodiversity and sustainable development for funding persuasion with various Govt. Ministry Departments and also with the State Bio-diversity board, Govt. of Maharashtra.

On this great mega event we convey our warm greetings and welcome all the delegates came from all over India and wish pleasant & fruitful deliberation ahead.

(Dr. J. D. Dhote)

From the desk of Organizing Secretary



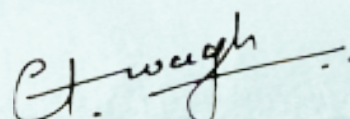
Dr. G. A. Wagh

Organizing Secretary, NCABCSD-2023 &
Professor, Deptt. of Zoology
Shri Shivaji Science College
Shivaji Nagar, Amravati, MS, India

It is our proud privilege and pleasure to welcome you for this 2 Day National Conference on “Advances in Biodiversity Conservation and Sustainable Development: Educational and Scientific Research Perspectives” organized by Department of Life Sciences, Shri Shivaji Science College, Amravati on 3rd and 4th March, 2023. The goal of this National Conference is to bring together academicians, researchers, managers, policymakers and other groups of scientific community, who are active in the related areas and to give them a forum for exchanging information through the presentation and discussion of papers dealing with wide variety of related topics. Apart from that, the recommendations will be made to priorities in the fields of biodiversity and sustainable development for funding persuasion with various Govt. Ministry Departments and also with the State Bio-diversity board, Govt. of Maharashtra.

The Conference being primarily Interdisciplinary in Nature Culminating the relevant fields of Life Sciences as well as their affiliating fields is supposed to be a needful try keeping the current Scenario in mind from the Department of Life Sciences, Shri Shivaji Science College, Amravati.

We would extend our warm welcome to the delegates and participants and thank them for being a part of this National Event.


(Dr. G. A. Wagh)

Working Committees for National Conference

“Advances in Biodiversity Conservation And Sustainable Development: Educational and Scientific Research Perspective” (NCABCSD-2023)” Date-3 & 4 March

Reception Committee	Transport and Accommodation Committee (Invited Speakers)	Registration & Certificate Committee
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3.Dr. A. S.Burghate	3. Dr. K. J. Gawai	3. Dr.G.D.Hande
4 Dr.U. V. Kale	4. Dr. S. S. Arsad	4. Dr.V.B.Khobragade
5. Dr.R. V. Itewad	5. Dr. S. K. Pawanikar	5. Dr.P.P.Khirade
6. Dr. V. J. Gaikwad	6. Dr. N. A. Kalambe	6.Dr.V.N.Sarkar
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8.Dr.D. D. Khedkar	8. Mr. Kartik Tiwari	8. Ms. RutujaTathod
9. Dr.J. D. Dhote		
10.Dr. S.P. Ingole	Communication Committee	Oral & Poster presentation Committee
11.Dr. R.A. Ingole	1. Dr.M.M. Bhonde (C)	1 Dr.S.P.Ingole (C)
12.Dr.R.R.Khokale	2. Dr.A.B.Bodade	2 Dr.S. J.Kawade
13 Dr.M. M.Bhonde	2. Dr.R.R.Khokle	3 Dr.S.V.Pundkar
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2.Dr. S. K. Pawanikar	2. Dr. S.P. Ingole	2. Dr. R. C. Maggirwar
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4. Dr. S. S. Arsad	4. Dr.D. D. Khedkar	4. Dr. A. S. Tekade
5. Dr. Harshali Wankhade	5. Dr.G. A.Wagh	
	6. Dr. R.C.Maggirwar	Local Hospitality
Panel Discussion	7. Dr. S. J. Kawade	1.Dr. M.M.Bhonde (C)
1. Dr. D. D. Khedkar (C)	8. Dr.A.R.Rajoria	2.Dr. Dr.A.S.Tekade
2. Dr. G. A. Wagh	9. Dr.N.R.Darsimbe	3.Dr. D.P.Rathod
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		4. Dr. R. R. Khokale
		5. Dr. S. E. Band
		6. All HODs

NATIONAL CONFERENCE ON
Advances in Biodiversity Conservation & Sustainable Development:
Educational & Scientific Research Perspective
(NCABCSD-2023)

Organized By:

Departments of Life Sciences & Science and Innovative center of
Shri Shivaji Science College, Amravati – 444 603, Maharashtra, India.
(3&4-March-2023)

CONFERENCE SCHEDULE AT A GLANCE

FRIDAY 3rd March, 2023	
08.30 To 10.00 AM	Registration, Tea and Breakfast
10.00 To 11.15 AM	Inaugural Function
Scientific session- I	
11.15 To 12.15 PM	Keynote Address-
	Dr. Basudev Tripathy, Officer-in-Charge Western Regional Centre, Pune, Zoological Survey of India TOPIC: ZSI IN SERVICE FOR NATURAL HISTORY, FAUNAL RESEARCH AND FOR SUSTAINABLE DEVELOPMENT.
12.15 To 01.00 PM	Invited Talk-IT-1
	Dr. Nishith Dhariaya, Professor, HNG University, Patan, Gujrat. Wildlife Expert & IUCN Co-Chair (Sloth Bear Group) TOPIC: RESEARCH AND MONITORING OF CERTAIN SMALL AND RARE MAMMALS: CHALLENGES, OPPORTUNITIES AND TECHNIQUES.
01.00 To 02.00 PM	Lunch
Scientific session-II	
02.00 To 2.45 PM	Invited Talk-IT-2
	Dr. (Mrs) Atya Kapley Chief Scientist Head Environmental Biotechnology & Genomics, CSIR, NEERI, Nagpur. TOPIC: MITIGATING LAND DEGRADATION WITH MICROBIAL POWER.
2.45 To 3.30 PM	Oral presentation-1 (Animal sciences)
03.30 To 3.45 PM	Tea Break
Scientific session-III	
3.45 To 4.30 PM	Invited Talk IT-3
	Dr. Dalip Kumar Upreti Head, Lichenology laboratory, Plant Diversity Division, NBRI, Lucknow. TOPIC: INDIAN LICHEN DIVERSITY AND ITS BIOPROSPECTION.
4.30 To 6.00 PM	Oral presentation-2 (Plant Sciences)

Scientific session-IV

06.00 To 6.45 PM	Invited Talk IT-4 Dr. J. Narayana Prof. & Head P.G. Department of Environmental Science, Kuvempu University, Shankargatta, Karnataka TOPIC: ECOLOGICAL, SOCIO-ECONOMIC VALUES OF WETLANDS AND CLIMATE CHANGE IMPACTS
6.45 To 7.00 PM	Tea Break
07.00 To 08.30 PM	Cultural Programme Venue: C.V. Raman Hall, Shri Shivaji Science College, Amravati
08.30 To 9.30 PM	Dinner

SATURDAY 4th March 2023

08.00 To 9.00 AM	Tea and Breakfast
Scientific session-V	
09.00 To 10.30 AM	Poster presentation
10.30 To 11.45 AM	Invited Talk IT-5 Dr. Atul Deokar, Deputy Conservator of Forest, Anti Poaching Unit, Pench Tiger Reserve, Maharashtra. TOPIC: PARTICIPATORY CONSERVATION PRACTICES FOR CRITICALLY ENDANGERED SPECIES LIKE WILD BUFFALO AND VULTURES IN GADCHIROLI AND ECO-RESTORATION OF DEGRADED HABITAT IN PENCH TIGER RESERVE, MAHARASHTRA
11.45 To 1.00 PM	Oral presentation-3 (Applied Sciences & Interdisciplinary Sciences)

Scientific session-VI

1.00 To 1.45 PM	Invited Talk IT-6 Dr. Arvind. Dhabe Professor & Head Department of Botany(Taxonomist), Dr. Babasaheb Ambedkar Marthwada University, Aurangabad (M.S.) TOPIC: IMMUNITY BOOSTER AND ANTI COVID-19 HERBS
1.45 To 02.30 PM	Lunch

Scientific session-VII

02.30 To 3.30 PM	Panel Discussion And Resolution
Valedictory Session	
03.30 To 04.00 PM	Valedictory Function
04.00 To 04.30 PM	High Tea and Distribution of Certificate

Conference Concludes

Sunday 5 March 2023

06.00 AM to 7.00 PM	Post conference tour to Narnala Wildlife Sanctuary, Melghat Tiger , Maharashtra for delegates as per the demand with separate registration fees.
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Keynote Address

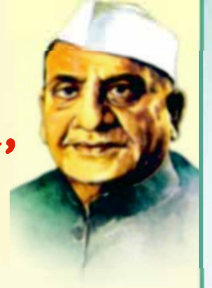


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Key Note Address

Taxonomy at Cross Road ? - ZSI in service for natural history, Faunal Research and for Sustainable Development

Dr. Basudev Tripathy,

Zoological Survey of India, Western Regional Centre, Akurdi, Ravet Road, Pune – 411 044 (MS)

Email: tripathy.b@zsi.gov.in

Faunal taxonomy is not only a classical research about naming an animal but provide vital information about the basics of animal kingdom, be it a single cell microscopic protozoa or the gigantic mammal. The subject of taxonomy in the academic curriculum is vanishing rapidly. In contrary, for conservation of biodiversity, it is essential to document the flora and fauna in the ecosystem so as to formulate suitable protection measures as well as to promote sustainable utilization of the bio-resource. In this context, the Zoological Survey of India, under the Ministry of Environment, Forests and Climate Change, Govt. of India is serving the nation conducting and promoting the faunal taxonomy and conservation by extensive surveys in the ecosystems and biodiversity rich areas including conservation of threatened species. It not only providing the baseline data on the animal diversity but also contributing at policy level through interventions more importantly towards formulating the Wildlife (Protection) Act, 1972, CITES, IUCN, CMS as well as CBD. Taxonomic research cannot and should not be restricted to only institutions but academic institutions should also come forward promoting this classical research for better understanding of the biodiversity of India and their conservation.

Keywords: Faunal Taxonomy, Conservation, Academic Institutions, ZSI, Research



Invited Talks



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Shri Shivaji Education Society, Amravati's
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INVITED TALK-I- DR. NISHITH DHARAIYA

Research and monitoring of certain small and rare mammals: Challenges, Opportunities and Techniques

Wildlife and Conservation Biology Research Lab, Department of Life Sciences, Hemchandracharya North Gujarat University, Patan (Gujarat) India – 384265

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Work on Mammals in India was started long back in late nineteenth century. William Thomas Blanford published the first edition of Fauna of British India– Mammalia in two parts in 1888 and 1981. His work is mainly restricted to southern and Central India. Later on, Bombay Natural Society conducted the Mammal Survey of India during 1912 to 1929. Wroughton reported 46 species from Central Province on the basis of these surveys. Pocock (1939, 1941) published Fauna of British India in two parts. Brander (1923) published a book entitled wild Animals of Central India, which included a list of 45 species of mammals from the region. Some more books on Indian mammals for example Mammals of India by Jerdon (1867), Check List of Palaearctic and India Mammals by Ellerman and Morrison Scott, (1951); Fauna of British India-Rodentia by Ellerman (1961), The Book of Indian Animals by Prater (1971) also provides information on mammals of Central India. Large mammals like tiger, lion, leopard, elephant, rhino and most ungulates are noticed easily and their distribution, population etc. are well studied by various scientists; however, it is very difficult to monitor and study the mammals which are smaller in size, usually solitary and largely nocturnal in their habit. The small sized mammals are less studied because of many reasons such as the secretive nature of a species, hard to find and observe in the field, lack of interest and funds and underdeveloped or poor methods to study them. Many small to medium-sized and nocturnal mammals can be surveyed by direct as well as indirect evidences, signs like footprints, scats, scratch-marks etc. are often not identifiable to species (similar species frequently occur together). Even the knowledge of local people is rarely clear enough for research or monitoring purposes. There are several such species of mammals which need to be studied for their status, distribution and occurrence. Assessments of the status of such species are becoming increasingly important for conservation purposes. There is an urgent need to encourage the studies on underappreciated and small mammalian species and identify their current status and conservation challenges in India.

Keywords: Mammals, Research and Monitoring, Conservation, Indian Animals.





INVITED TALK-II- DR. ATYA KAPLEY

Mitigating Land Degradation with Microbial Power

Chief Scientist, Head, Environmental Biotechnology and Genomics Division CSIR-NEERI, Nagpur 440020

Email- atyakapley@gmail.com

Anthropogenic activity including urban encroachment, improper land use, and contamination of our natural resources are the key factors that have caused biodiversity loss and ecosystem degradation. Sustainable remediation includes a combination approach, using microbes and plants along with engineering tools to address land degradation. Degraded land is widespread across the country and may be classified into different categories such as contaminated soil, water-logged soil, dry/ desertification, eroded soil, and saline soils. The causes could be man-made, such as pollution run-offs, untreated wastewater, over-grazing, rapid urbanization, over exploitation of resources; or natural causes like wind / water erosion and natural disasters.

Microbes are the silent environmental warriors that can be used to remediate any niche. Wastewater is a dynamic niche with constantly changing concentrations of carbon source and xenobiotics provide a challenge to the microbial community, while soil has challenges of aeration and leachates, to name a few. Besides, environmental parameters, like pH, temperature, availability of carbon source, nutrients and prevailing stress conditions affect the catabolic activity of the inherent microbes. However, the capacity of bacteria to adapt to the surroundings and share selected genes to the community via horizontal gene transfer is a unique property that allows their use as bioremediating agents. Besides their catabolic activity for pollution removal, bacteria are natural nitrogen fixers and able to tolerate and grow under different soil conditions. This enables their use to rejuvenate degraded soil and slowly promote ecosystem rejuvenation.

Keywords: Land Degradation, Urban Encroachment, Bioremediating Agents, Ecosystem, Bacteria.





INVITED TALK-III- DR. DALIP KUMAR UPRETI

Indian lichen diversity and its Bioprospection.

Head, Lichenology laboratory, Plant Diversity Division, NBRI, Lucknow

Email-upretidknbri@gmail.com

India being a megadiversity country exhibit rich diversity of lichens represented by 3005 species which is more than 15% of the lichen species known from the world. During the last five decades mostly the Indian Himalayan regions and Western Ghats of the country were exhaustly explored for their lichen wealth. Lichens of some specific habitats such as monuments/ old historical buildings, mangroves different phorophytes were also studied from the country. Revisionary studies on both micro and macro lichens genera belongings to the lichen family Parmeliaceae, Lecanoraceae, Pyrenulaceae and Thelotremaaceae were well worked out following the modern concept of lichen classification.

Out of the lichen species reported from India, lichen family Graphidaceae exhibit maximum diversity represented by 491 species followed by Parmeliaceae with 352 species, while at generic level lichen genus Graphis shows maximum diversity with 132 species. Though, the difficult terrains of eastern Himalayan regions are yet not explored for their lichen wealth, however, it is one of the major centres of lichens diversity in India similar to Western Ghats. The coastal regions of the country exhibit luxuriant growth of lichens on Palms, while Oak tree species in Himalayan regions and *Shorea robusta* tree in central regions provide excellent substrates to lichens for colonization.

The lichens of Eastern Himalayan regions shows their affinity vis-à-vis to sino-japanese elements while the lichen flora of western Himalayan regions shows affinity with lichens of North American and arctic regions of Russia. The central plateau of India has cosmopolitan species of lichens mostly similar with lichens of South African regions.

Multidimensional approaches to explore the utility of lichens in the field of environment monitoring, biodeterioration and nanotechnology are initiated recently as taxonomical account of different lichen taxa together with lichen diversity of country are available. The lichens are well known for their use in air pollution monitoring both for organic, inorganic, metalloids and radionuclides in the environment. Utilizing lichen diversity and distribution pattern and metals accumulated, the air pollution monitoring in Himalayan cities such as Dehradun, Badrinath, Uttarkashi and Pauri together with Mahabaleshwar in northern Western Ghats and Dhar in central Indian regions were completed and information on the present pollutant load in lichens and environment are available. Mostly the pollutants originated from vehicular activities and metals around thermal power plants were studied utilizing lichens available in and around them naturally or if not transferred manually from a nearby area.

The biodeterioration activities of lichens on monument and historical buildings not only provide information on the extent of damage to the buildings but also indicate the environmental changes in the surrounding area. The lichen biodeterioration studies on Bhimbetka world heritage zone, monuments of Dhar in Madhya Pradesh and major monuments of Odisha, Uttarakhand and Uttar Pradesh are completed and account of lichens growing on monuments and causing damage to their substratum are available. The available information on monumental lichens are useful for Archaeological Survey of India an agency responsible for conservation of the monuments.



The lichen ecological studies in different forest regions provide status of forest health and useful data for adopting various management strategies. The lichen ecological studies with reference to forest health were completed in Achanakmar Wildlife Sanctuary in Central India, Greater Himalayan National Park in Himachal Pradesh and few localities in Chamoli district of Uttarakhand. Ecological studies on lichens of north eastern states of Mizoram, Manipur and Nagaland are recently initiated. Apart from the protected areas lichens of some special habitat such as on common trees (*Shorea robusta* in central Indian regions) and *Quercus* trees in Indian Himalayan regions and mangroves in eastern and western coast are also studied recently.

Lichens play an important role in carrying out different climate change studies due to their slow growth rate and uniform growth size help in dating the exposure time of the sequence of the rock forming glacier moraines due to retreat of the glacier which provide the approximate time of glacier retreat (Lichenometry). The lichenometric studies in Thajiwas Glacier in J&K, Pindari Glacier in Uttarakhand, Kupup and Thangu areas of north Sikkim were carried out. A number of remote sensing data can be employed to map lichen distribution pattern at various scales. The spatiotemporal changes in the distribution of lichen communities can be used to develop predictive climate change models. Lichens distribution pattern in higher alpine regions of Indian Himalaya play vital role in long term climate change monitoring programme of Indian Space Research Organization (ISRO).

Climatic fluctuations which largely affects species turnover and cause major shifts of terrestrial ecosystem can be monitored with the help of preserved old lichen herbarium specimens, compared with recent collection together with quantification of elements, PAHs accumulation and carbon isotope composition ($\delta^{13}C$). Such studies were carried out in Darjeeling area of West Bengal and data on other sites are also available to carry out researches in near future.

The vast geographical area and rich diversity of lichens in the country provide a lot of scope to utilize Indian lichens for their potent phytochemicals. The lichens may be a good source of unique phytochemicals, however not much work has been done so far for their medicinal bioprospection and other economic uses in India, probably due to their low biomass and slow grow rate in nature. An account of five hundred medicinal lichens is available from the world however, in India only 160 medicinal lichens are known. The in-vitro culture of lichens initiated recently will definitely help to mitigate exploitation of the medicinally important lichens. Further investigations on biological activity of lichens as well as fast isolation method of lichen metabolites are needed to attract other researches in search of novel compounds beneficial for human kind. Apart from lichen culture, developments of anti-microbial nanomaterials from the lichen compounds are some of the recent advances in lichenological research in India. Having more functional polar groups the lichen compounds provide different active sites to easily develop the potent nano-materials of various economic uses. Lichens also exhibit a wide array of endolichenic fungi found growing inside their thalli and offer an opportunity to discover emerging natural drugs useful for human beings in near future.

The taxonomical knowledge available on lichens will not only help in assessment of diversity and distribution of lichens in the country but also useful in carrying out bioprospection, biodeterioration, biomonitoring and climate change studies together with development of databases for future research work on Indian lichens.



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In the recent years after the use of molecular techniques and modern concept in lichenology a large number of nomenclature changes have been established therefore to keep pace with the recent concept there is a scope to further revise the lichen taxa from India. A large number of localities situated in remote and difficult terrains in the Indian Himalayan regions are not well explored lichenologically. A more intensive and extensive exploration in these areas will definitely provide a more detailed account of lichen diversity in India and their use in carrying out different bioprospectational aspects useful for human welfare.

Keywords: Lichen Diversity, Bioprospection, Biodeterioration, Lichenology.





INVITED TALK- IV- DR. ATUL DEOKAR

Participatory conservation practices for critically endangered species like Wild Buffalo and Vultures in Gadchiroli and Eco-restoration of degraded habitat in Pench Tiger Reserve, Maharashtra

Asst. Conservator of Forest, Anti-Poaching Unit, Pench Tiger Reserve, Maharashtra

Email:atuldeokar.d@gmail.com

India is among the 13 most bio-diverse countries in the world. Though it is 2nd most populous and 3rd largest economy, the rich cultural aspects and ancient history of conservation helped her to maintain biodiversity. Various customs, taboos, myths in society derived force for conservation. The participatory model of scientific techniques along with social practices or people participation will results in better recovery of some endangered species. The conservation model developed for wild buffalo and vultures in Sironcha forest division is one of such model. The project of eco-restoration of degraded habitat in context of carbon sequestration and generating livelihoods for locals is the next level of participatory conservation practices which is followed at Pench tiger reserve, Maharashtra.

Wild buffalo (*Bubalus arnee*) is one of the highly endangered species found only in Chhattisgarh & Sironcha part of Maharashtra. The wild buffalo presence is recorded up to Pranhita-Godavari river border only. The efforts were taken by Maharashtra forest department to record the data about this critically endangered species. The said area is highly infested with naxalite activities so the data collection was not an easy job. Primary data is collected from locals and area is declared as Kolamarka conservation reserve. An initiative of a monitoring team of 10 local youths with GPS enabled cameras was found fruitful. This initiative helped to identify two herds and one alpha male of wild buffalo. The initiative of providing necessary things to cattle in proximity of village helped to reduce pressure on wild buffalo habitat. The process involved was to mitigate the things by providing alternatives than just restrictions and it results in better way for both wild buffalo and local.

Vulture population is decreased by 99% and very few places are with sizeable population. By two different schools of thoughts, Diclophenac and avian malaria are considered as major reasons of their decline. In Kamapur part of Aheri tehsil in Gadchiroli district, an individual of White backed vulture (*Gyps bengalensis*) was seen in March, 2013. Then on interaction with locals, the sightings from past were recorded from Dhorphodi sites of village. Dhor means cattle and phodi means opening the cattle carcass. The cattle carcass from village usually brought to particular site to remove skin and open the carcass as a custom followed in village. This was helping the vulture to locate the food. But in recent times, the custom was not much followed so the sightings of vulture feeding on carcass were rare. So Maharashtra Forest department started to rejuvenate the customs by providing some incentives to cattle owner and employing a local youth as “GidhadMitra” (Friend of Vulture). The Dhorphodi sites got protected and named as ‘Vulture restaurants’. It helped to increase the vulture population of area to more than 300. It shows that assisting the customs with scientific inputs will be helpful for conservation of species.

Totladoh reservoir is one of the major reservoirs in Vidarbha region. The site is within Pench tiger reserve, Maharashtra and Madhya Pradesh. The dam construction started in 1974 and completed in 1994. The labour force involved was more than 20000 which was temporarily settled inside Pench



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national park, affecting the wild habitat of Tiger and other species. After court procedures, finally area handed over to Forest department in 2018. The area of around 272 Ha was under direct influence of degradation. The project of eco-restoration was sanctioned under National Adaptation Fund for Climate Change where the practices like soil working, Weed eradication, High Density plantation, Meadow development and stream works were adopted to get it eco-restored. The complete project was targeted to get 11000 tonnes of carbon sequestration with minimal carbon footprints. The activities involved were taken for generating carbon credits through a new project. The public involvement in forest fire control, illegal felling also helped to generate carbon credits. All total resulted in approximate Rs. 3 crore annual benefits by selling carbon credits. All the benefit will be shared equally in all villages of buffer area of Pench. This project of eco-restoration is not just helped to restore wildlife habitats but to generate more livelihoods for locals.

Keywords: Pench, Vulture Restaurants, Eco-Restoration, Wild Buffalo, Critically Endangered Species.





INVITED TALK- V- DR. J NARAYANA

Ecological, Socio-Economic Values of wetlands and Climate Change Impacts

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Wetlands are the areas where the water table is at or near the surface level or the land is covered by shallow water with rich diversity of hydrophytes. Wetlands occupy 6% of the earth's surface and are highly fertile areas and are amongst the most productive ecosystems of the biosphere. They account for 4.7% of the Indian Geographical area. More than 50% of the world's production depends on the wetlands. Today 30% of the Indian wetlands have been lost. And 35% of wetlands have been lost at the world level.

Wetlands are valuable resources and can provide useful functions such as water storage and purification, wildlife and aquatic habitat and outdoor recreation and education. Ecotourism attracts the wetlands because of aesthetic values. Wetlands are one of the most productive ecosystems on the earth and providing wide range of ecosystem services vital for human well-being and poverty alleviation. Wetlands also have a deep connection with **Indian culture and traditions**.

Wetlands support a wide range of biodiversity and help to maintain natural cycles. They replenish water resources and protect coastlines. Macrophytes diversity are important habitat for fishes, insects, amphibians, reptiles and other wild life. Ecologically speaking, the wetlands are important Eco tones, transition between open water and land endowed with a definite structure and function to perform specific ecological balancing roles.

Phytoplanktons are the best indicator to know the status of water quality. Some species flourish in highly eutrophic waters, while others are very sensitive to organic and chemical loads. Some species develop noxious blooms, sometimes creating offensive tastes and odor or anoxic or toxic conditions, resulting in animal deaths or human illness to those who consume them.

The fish population in aquatic system plays a significant role in the human economy. Karnataka has large number of fresh water bodies, which includes, ponds, lakes reservoir etc. They are rich in fish diversity. A perusal of available literature has revealed that most of the water bodies are not explored for the fish diversity. Wetland is natural habitat of amphibians. Amphibians breed in water. Their permeable skin and eggs are particularly sensitive to pollution and other changes in water quality.

Birds are the best indicators of the current status of wetland habitats. Wetland habitat provides the sites for various migratory birds for nesting and breeding. In India population of water birds are disperse across a network of small tanks and ponds. Individual sites may or may not hold a large population of birds at a given time, but taken together these wetlands can support large numbers. Conservation of these water birds therefore depends on maintaining the character of the network of small but important wetlands. Nesting behavior is also conservation problems of the wetland birds and their habitat.

The most important environmental issues concerning aquatic ecosystems are soil erosion, weed infestation, human encroachment, pollution and aquaculture. Because of the effects of such environmental phenomena, there has been a loss of biological diversity, deterioration of water quality,



increased sedimentation, marked shrinkage, decrease in the density of migratory bird population, fishes, other aquatic fauna and luxuriant growth of aquatic weeds. Weed infestation is a problem for almost all the wetland. Some dominant weeds can hamper the normal ecological functioning of water bodies. Encroachment by human is another serious threat and is one of the ongoing anthropogenic pressures.

A large number of Indian water bodies receive domestic sewage, solid waste and industrial effluents. These causes widespread pollution and eutrophication. Indiscriminate conversion of aquatic ecosystems into the sites of aquaculture and agricultural activity without proper land use planning also resulted in great damage to a number of important wetland systems. Large quantity of fertilizers and animal waste find their way into the waters from the cultivated catchment, leading to prolific growth of weeds and accelerating eutrophication. The high level of nitrogen and phosphates in the lake water are indication of pollution and eutrophication. The expanding human activities have extensively altered the fresh water ecosystem with modifications in physical, chemical and biological features of aquatic ecosystems. These changes have severe implications on human wellbeing. The management of this fragile ecosystem is very much essential if human have to sustain on earth.

Wetland degradation and loss reduce their ability to support biodiversity. Globally, natural wetlands are gradually disappearing due to human interference mainly by way of agriculture or aquaculture. Habitat destruction via land-use change has been identified as one of the causes responsible for loss of biodiversity. Improper management of wetlands, lack of implementation of conservation plans, increase in pollution, and rapidly increase in the requirements of water are affecting the species diversity.

Climate change can affect wetlands by direct and indirect effects of rising temperature, changes in rain fall intensity and frequency, extreme climatic events such as drought, flooding and the frequency of storms. Altered hydrology and rising temperature can change the biogeochemistry and function of the wetland to the degree that some important services might be turned into damages.

Wetlands have become a major conservation interest since the mid 1970's. Better understanding of their ecological role has now become very important. It is now recognized that wetlands are important wild life refuges, nurseries and improve water quality and reduce flooding. Wetlands have been described as kidneys and biological super markets, wetlands filter impurities from water as it passes through. They especially remove nitrogen and phosphorus and several organic and inorganic pollutants. They also reduce sediment and suspended solids from the water column. It's role as biological supermarket is as a support bases for food chains and for the large assortment of plants and animals that are drawn to them as permanent or season habitat.

Since 1970, 35 percent of the world's wetlands have been lost. Nearly 30 percent of the natural wetlands in India have been lost in the last three decades, mainly to illegal construction, unsustainable urbanization, agricultural expansion, and pollution.. As per the report Chennai lost 90 percent of its wetlands to unplanned urbanization, leaving the city to grapple with issues of water security and a degraded environment. Hyderabad lost 55 percent of its wetlands to inefficient waste management, rising pollution and unchecked urban development.

Mumbai lost 71 percent, and the Delhi-National Capital Region lost 38 percent of wetlands mainly to construction and eutrophication from pollution.



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Ramsar site is a wetland site designated to be of international importance under the Ramsar Convention, also known as "The Convention on Wetlands." The Ramsar Convention on Wetlands is an international treaty for "the conservation and sustainable use of wetlands". It was signed on February 2, 1971 in Iran in the city of Ramsar. Every year, February 2 is observed as World Wetlands Day. There are over 2,400 Ramsar Sites covering 2.5 million sq. km on the territories of 171 Ramsar Contracting Parties across the world. Currently, India has 75 Ramsar sites.

Wetlands not only support high concentrations of biodiversity, but also offer a wide range of important resources and ecological functions. India is proudly reversing the global trend of shrinking wetlands, with the largest network of Ramsar Sites for any country in South Asia. Making sustainability a key aspect of development, there has been an overall improvement in how India cares for its wetlands. But it is important for various stakeholders along with the local community and corporate sector to come together for an effective management of wetlands.

Keywords: Environmental Issues, Ramsar Sites, Eutrophication, Wetlands, Socio-Economic Value.





INVITED TALK- VI- DR. ARVIND DHABE

Immunity Booster and Anti Covid-19 Herbs

Professor and Head, Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad-431004.

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India is one of the 12 Mega diversity centres of the world. It has about 18000 species of flowering plants, out of which around 7500 species are considered to have medicinal properties. Ayurved is indigenous science of life. Ayurvedic medicines are mostly derived from plants. There are some medicinal plants which improve immunity. The active principles of the medicinal plants are responsible for the boosting immunity. Some of such common, easily available medicinal plants will be explained during the talk.

During the pandemic and lock down period of Covid-19, some of the immunity boosting plants were collected and various formulations were prepared by considering their properties against the symptoms of Covid-19.

The formulations were extracted in ethanol by Soxhlet's extraction method. These extracts were sent to Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram to test their efficacy against SARS-Co-V2 on pseudovirion platform and International Center for Genetic Engineering and Biotechnology, New Delhi on live virus platform.

It was observed that one of the formulations showed 81% virus reduction on live virus platform which is developed into Capsule form. The another one showed 50% virus reduction, which is developed into decoction. The combination of both the formulations proved to be an effective medicine against COVID-19.

Key words: Immunity Boosting Herbs, Covid-19, Virus, Ayurvedic Medicines, SARS-Co-V2.



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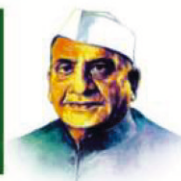


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- e - Classroom.
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- Students achieve the ranks in ICAR, JNU, MCAER CET & PG Entrance Examination.
- Swapnil Thakare All India Topper in ICAR PG Entrance Examination (2016)
- Sanket Ghumade (2nd rank) Suraj Zoting (4th Rank in MCAER CET & PG Entrance Examination. (2021)
- Suraj Zoting (85th Rank) in GAT-B & Shruti Raut 136 Rank in GAT in all India Rank.
- Polyhouse, Workshop for Farmers, Protected Cultivation of Horticultural Crops.
- College vehicle facility
Students demonstration field plots, Exotic Vegetation Cultivation.

President

Shri Shivaji Education Society, Amravati

Principal

Shri Shivaji College of Agril. Biotechnology, Amravati

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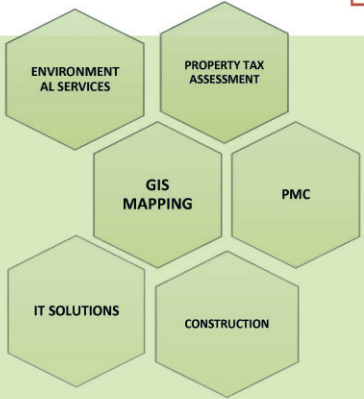


Abstracts
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Freshwater Pearl Culture in India – A Review

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In India, freshwater pearl culture is proving as one of the profitable aquaculture farming techniques. Pearls have great commercial demand in national and international market. Now a days designer pearls are fetching markets. The natural process of pearl formation is remolded with innovation and standardization to produce pearls from freshwater muscles species. Three species of freshwater mussels as *Lamellidens marginalis*, *Lamellidens corrianus* and *Parreysia corrugata* are used for pearl production in India. This paper is presenting a review on history, methods of cultivation and recent status of freshwater pearl culture in India.

Keywords: Freshwater Pearl Culture, Freshwater Mussels, *Lamellidens marginalis*, *Lamellidens corrianus* and *Parreysia corrugata*.

Use of an easily available herb *Withania somnifera* (Ashwagandha) extract in Aquaculture, study on histology of liver of fresh water fish *Channa punctata*.

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The study of the microanatomy of cells, tissues, and organs as viewed via a microscope is known as histology. It depicts the link between structure and function. A slight change in the histology of organs has played a pivotal role determining the life span of the organism. In this study, the effect of *Withania somnifera* extract on the histology of liver of fresh water fish *Channa punctata* was studied on different concentrations and a long duration. The liver of fishes fed with *Withania somnifera* shows fatty degeneration when fed with higher concentration feed and for a long duration. Use of ashwagandha at lower concentration and short term shows great results.

Keywords: Histology, Lifespan, *Withania somnifera*, *Channa punctata*.



Study of Diversity of Scolopendrid Centipedes (Chilopoda: Scolopendromorpha) in Achalpur Region, District Amravati, Maharashtra, India.

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The present communication paper deals with the diversity of Scolopendrid Centipedes fauna in Achalpur region, Amravati district of Maharashtra, India. This study was performed during July 2021 to October 2021 for total four months by visiting different habitats of Achalpur region. Samples were collected by using different collection methods such as hand collection method by using forceps and species were identified with the help of standard taxonomic literature. Total 04 species of Centipedes belonging to 02 genera namely *Scolopendra* and *Cormocephalus* under family Scolopendridae were identified from the study area.

Keywords: Centipedes, Diversity, Scolopendridae, Chilopoda, Species.

Study of Fish Diversity of Wai Lake, District Yavatmal, (M.S.) India

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The current study was carried out to find the diversity and abundance of fishes in the selected sites of Wai Lake in Maharashtra for a period of 1 years that is from Jun 2021 to July 2022. Fishes belongs to 5 orders and 8 families were collected during the course of study period. Total 21 species of different 18 genera were recorded from the Wai Lake. The order Cypriniformes were dominated by 9 species followed by Osteoglossiformes 5 species, Siluriformes and Synbranchiformes with 3 species each, Perciformes 2 species and Beloniformes with only one species. Family Cyprinidae was dominant group with 9 species in the assemblage composition in which *Catla catla*, *Labeo rohita*, *Cirrhinus mrigala* and *Puntis ticto* were found most abundant. Highest number of species were observed on site 4 followed by site 2. For the measurement of diversity a total of two diversity indexes were used Shannon and Simpson index. Shannon index showed the similar trend and ranged from 2.27 to 3.48 and Simpson index ranged from 0.01 to 0.02. The present data was compared to the previously published data and it showed that the overall diversity is still conserved but there is massive decrease in the number of particular species. Therefore proper scientific management of the aquatic resource, implementation of laws for illegal fishing, further study regarding the activities effecting the diversity and implementation of new methods and protocols for their sustainable conservation is at urgent need.

Keywords: Diversity, Abundance, Fishes, Wai Lake.



Study of BMI & Hb Percentage Observed in Tribal People of Chikhaldara Region.

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The present cross – sectional study was undertaken among the tribes of Chikhaldara Dist. Amravati. This study used to investigate the hemoglobin percentage and body mass index (BMI) among male and female tribes of Chikhaldara region. Total 275 males and 319 females were taken for examination. Hemoglobin percentage were analyzed by Sahli's method and commonly used indicator is weight (wt) and height (ht) were measured to calculate body mass indices to evaluate nutritional status. The test of statistical significant (t.test) was used to compare population groups. The normal values of hemoglobin percentage and BMI were not observed in any age groups of total served tribal people of Chikhaldara region.

Keywords: Hemoglobin %, BMI, Tribes, Chikhaldara, India.

Trace Element Content in Fingernails and Hair of a Non Industrialized Population.

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Sampling of human beings for trace element content can be a complex and costly procedure. The use of hair and nails simplifies the process and it is for this reason that such samples are extensively used. It is observed that there exists some positive correlation between element levels in hair and nails, hypertension, and diabetes of these subjects. When studying the relationship of minerals to human health, it becomes increasingly evident that keeping a balance level of minerals in every organ, tissue and cell of the human body may be a prominent key to maintaining a healthy existence. Trace elements analyzed by Atomic absorption spectrophotometer.

Keywords: Trace Elements, Hairs, Nails, Spectrophotometer.



Study on Local Fish Diversity (Except Major Carps) in the Borgaon Reservoir, Yavatmal, Maharashtra

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The present study revealed the local fish diversity of Borgaon Reservoir, Yavatmal District, which is located near the Madani Town. This dam was constructed in 1993 as part of Irrigation Projects by the Government of Maharashtra on a local Nallah River. In this study, Samples were collected with the help of local fishermen by using fishing nets and identified with the help of identification keys. Total 10 local fish species belonging to 5 orders and 6 families were recorded. The order Cypriniformes was the most dominant order having 5 species which are *Puntitus dorsalis*, *Chela cachius*, *Labio bata*, *Puntitus sophore*, *Labeo cylindricus* under family Cyprinidae. Order Siluriformes contribute 02 species under the family Siluridae and Bagridae, order Anguilliformes, Anabantiformes, Osteoglossiformes each contributes 01 species under the family Anguillidae, Channidae, Notopteridae. Further study will continue with the relation of feeding habits and pathogenicity and hope the diversity number will also increase.

Keywords: Local Fish Diversity, Borgaon Reservoir, Yavatmal District, Maharashtra.

Behavioral Study of Edible Crabs around Gram Khari Dam Dharni Region of Western Melghat

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This study reveals that the Crabs were observed for their behavioral patterns as they migrate from their nesting outside the dam and reaches nearby farm field around the dam at midnight for the food purpose. Crabs can move from one place to another simultaneously observed their behavioral patterns of feeding and their social communication amongst the other crabs and they were again came back to their own nesting and reside whole day inside the tunnels inside the muddy area for resting whole day.

This study recommended that the daily observation of behavioral aspect as they moving patterns from their nest for the purpose of food as omnivores feeding habitat of crabs.

Keywords: Behavior, Food, Edible Crabs, Nesting, Moving Patterns.



Effect of *Cassia tora* linn Plant Extract on The Economic Parameter of Silkworm, *Bombyx mori* L.

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The influence of *Ipomoea indica* plant extract containing phytoecdysteroids were tested against 3rd, 4th & 5th instars larvae of silkworm for improving the performance of growth and cocoon characteristics of silkworm, *Bombyx mori* L.

The various concentrations of *Ipomoea indica* plant extract (5, 10, 15, 20, 25 mg/ml.) were administered to 3rd, 4th and 5th instars silkworm with mulberry. The larval weight, cocoon characteristics were influenced by various concentration of plant extract. The intensity of influence was depends on the time and dose exposure. The plant extract at 20mg/ml. concentration resulted higher larval growth and increased cocoon weight. The mean larval weights, relative growth rate of silkworm, *Bombyx mori* were increased. The average pupa weight, shell weight, shell ratio and silk filament length were also increased with this supplementation of plant extract over the control.

In the present study, phytoecdysteroids of *Ipomoea indica* plant extract enhanced the quality and quantity of silk in *Bombyx mori*.

Keywords: *Bombyx mori*, Parameters, Plant Extract.

Avifaunal Diversity at and around Lanjud Dam of Buldhana District, Maharashtra

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The avifaunal diversity at and around Lanjud dam was studied from October 2021 to September 2022. The present study was carried out to find the avian diversity of the study area. The birds were observed and photographed using a digital camera. The study reveals that a total of 56 species including water birds and land birds belonging to 33 different families and 15 different orders were recorded. Out of the finding, 47 bird species were residential, 8 bird species were residential migratory and 1 species was winter migratory. During investigation 52 are Least concern, 02 are Near threaten, and 02 are Non assessment birds recorded.

Keywords: Avifauna, Lanjud Dam, Diversity, Bird Diversity, Khamgaon.



Herbal Remedies for People Suffering with Thyroid Disorders

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Development of Thyroid disease is presenting great challenges to countries worldwide. In India too, thyroid disorders is a major concern these days. This increase in thyroid disorders may be due to more and more frantic lifestyle that people engage themselves in today and similarly because of the lack of suitable nutrients in the soil. Hypothyroidism and Hyperthyroidism are the two main disorders caused by a variety of conditions and also passes through the generations by inheritance. Millions of people in the world are suffering from thyroid disorders. A woman is about seven to ten times more likely to be diagnosed with a thyroid conditions than men. Medicinal plants are part of the social life of people and play a crucial role in health management. The study showed that the herbal remedies to thyroid disorders are less expensive, harmless, easy to access, eco-friendly and potentially effective. In present study we aim to focus on effectiveness of select herbs on curing thyroid disorders and study their effects on thyroid disorders with respect to the following parameters: blood pressure, body temperature, body mass index and pulse rate. Herbal treatments in thyroid patients moderate these parameters and the main benefit of herbal remedies is that they are quite safe with no side effects. The effective herbs in thyroid disorders are discussed in detail in the present study.

Keywords: Thyroid disorders, Herbal Remedies, Medicinal Plants.

Assessment of Fish Diversity at Kolhi Station in the Fresh Water Reservoir- Bembla of Yavatmal District, Maharashtra.

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Bembala is a freshwater reservoir (dam) and major irrigation project constructed in Godavari basin, across river Bembala near Khadak - Sawanga in Babhulgaon Taluka of Yavatmal District Maharashtra state. It is 29 km away from Yavatmal, and is situated at longitude 78⁰13' and latitude 20⁰59'. Diversity of Ichthyofauna has been studied at Kolhi station near Falegaon, 8km away from the main gate in the backwaters from the period June, 2022 to february, 2022. Primary investigation reports reveal that the ichthyofauna belong to 09 order and 10 families. Total 16 species were observed from which 3 species belong to order Siluriformes, 4-Cypriniformes, 2-Anabantiformes, 1-Anguliniformes, and 1-Osteoglossiformes, 1-Channiformes, 1-Mugiliformes, 2-Perciformes, 1-Cichliformes. Among these, Cypriniformes order is dominant. study was carried out for limited period still the search is continue and hope in future the diversity number will goes on increasing. In the coming days we are mainly focus on other seasonal variations relating to diversity, pathogenicity and most importantly their some of the nutritious values.

Keywords: Fish Diversity, Kolhi Station, Bembla, Yavatmal, Maharashtra.



Toxicity of Herbal Extract of *Mundulea sericea* against Housefly (*Musca domestica*)

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The housefly, (*Musca domestica*) is well-known cosmopolitan insect pest found everywhere around us. They are in association with humans or the activities of humans. Housefly is the most common species found in piggery and poultry farm, horse stables and ranches. Houseflies carry more than 100 pathogens on their body that is act as carriers of disease-causing agents like bacteria, viruses, fungi, protozoa and metazoan parasites. They are most active and live longest in temperature between 10°C to 26.6°C. Adult flies inactive at temperature below 7.2 °C or above 44.4 °C. In warm conditions, it completes its life cycle in seven to ten days.

Mundulea sericea is a small tree belonging to the family *fabaceae*, distributed in dry forests and rocky hills of West and South. They are an attractive virgately branched graceful small 14 tree 0.5-7.5 m tall, usually single-stemmed with a bushy, much-branched crown. The plant is reported to have an insecticidal property. Rotenoids such as rotenone, deguelin and tephrosin, isolated from *Mundulea sericea*, have been used as poison. The toxicity of essential extract from *Mundulea sericea* leaves and seeds against *Musca domestica* third instar larvae by mixing with food media. The aqueous extract of *Mundulea sericea* leaves and seeds was effective against *Musca domestica* 3rd Instar larvae as nearly 100% mortality was observed at 100 ppm. The data obtained from the study it was observed that *Mundulea sericea* leaves and seeds extract were highly effective as larvicide for providing better for the control of *Musca domestica*. All essential extract in this study has high potential for development of green product for housefly management. Herbal products are said to be environmentally safe and safe for human health alternatives to insect pest control.

Keywords: Housefly, *Musca domestica*, *Mundulea sericea*

Nest Tree Preference by Indian Grey Hornbill in Pench Tiger Reserve, Madhya Pradesh

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Hornbill is one of the most recognizable group of birds in the Old-World tropics. There are 54 species of hornbills in the world and 09 species occur in India. The Indian Grey Hornbill is found in India, Pakistan and Nepal. In India it is distributed throughout the country, excepting for Malabar area, some parts of Rajasthan and Assam. In PTR of Madhya Pradesh two species of Hornbills were recorded named as Malabar Pied Hornbill and Indian Grey Hornbill. According to the IUCN Red List (2021), Indian Grey Hornbill listed as Least Concern. Hornbills play an important role in seed dispersal and forest regeneration and it is indicator species of healthy forest. The population of hornbill species is declining very rapidly



because of deforestation, habitat degradation, and forest fragmentation. In this scenario hornbills' study is important and hence this attempt was made.

The study was conducted from March 2021 to July 2022 in Pench Tiger Reserve M.P. Survey was carried out in morning (6:00-09:00) and at evening (04:00-06:00). All the observations were done by using binocular and photographic documentation done by using Nikon camera. During the study in PTR, total 50 nesting cavities of Indian Grey Hornbill were recorded during breeding season which belongs to 09 plant species, among 09 plant species *Madhuca indicawas* mostly used for nesting(40%) followed by *Terminalia arjuna* (16%),*Bridelia retusa* (10%), *Bombax ceiba*(10%),*Hymenodyctyon orixense* (8%), *Terminalia tomentosa*(6%), *Grewia tiliaefolia Vahl*(4%), *Syzygium cumini*(4%) and *Millettia pinnata* (2 %). Out of these 50 nest sites, 31 come under the protected area while 19 come under the buffer area. The mean height of the nest trees was 36 ± 6 m, girth at breast height 3 ± 1 m and nest height 17 ± 6 m.*Madhuca indica* and *Terminalia arjunam*ostlypreferred by Indian Grey Hornbill for nesting in study area, because of longevity with maximum height, more resistance to climatic condition and better population in study area. These two plant species supports the successful nesting and significant population of Indian Grey Hornbill in Pench Tiger Reserve.

Keywords: Indian Grey Hornbill, Nesting Tree, Preference, Pench Tiger Reserve, Madhya Pradesh

The Tale of the Sinking Town: Joshimath

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Recently in the news we all have heard about joshimath crises major cracks are developing on road and houses across joshimath which is a matter of concern for everyone. Followed by the residentail space for living joshimath is a beautiful place located at chamali district of indian state uttarakhand with a height of more than 6150 feet. However, the main concern is why this type of crises takes place what measures we should follow to control this type of crises this is all what we will learn in this presentation. The main reason for such crises is exogenic force which includes weathering, soil erosion, deposition, also human activities such as construction, evacuation, drainage systems, etc. This Study reveals that slope, rainfall amounts and lithology as the main environmental controls on landslide occurrence. Our model spatially predicts landslide occurrences and can be adapted for other rainfall scenarios, and thus has potential applications for efficiently allocating efforts for road maintenance. To this end, our results highlight the vulnerability of the Himalayan road network to landslides. Overall the problem can simply be classified as the problem of sustainable development.

Keywords: Josh Math, Exogenic Force, Soil Erosion, Drainage Systems, Lithology, Sustainable Development.



Avian Species Diversity in Riverine Habitat of Melghat Landscape, Amravati, Maharashtra.

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Riverine birds constitute an essential component of the biological community of a riverine system. Birds have ecological value as an important element of the natural system. They keep the climate stable and play important role in the effective functioning of these systems. The riparian zones have high value in terms of diversity because they share features with both adjacent upland and aquatic ecosystems. This study was carried out to determine the diversity and abundance of riverine avian fauna in the selected areas of Melghat landscape. This study was selected because riparian zones and fresh water wetland ecosystems have had the greater decline of any other habitat type.

This study was carried out from November 2022 to January 2023 for three months in the rivers of Melghat Landscape. For this target, the point count method was used in the study stations. Two stations were selected from the Tapi River i.e., Rangubeli and Katunga and two stations from the Sipna River i.e., Semadoh and Harisaal, and data was collected from these stations. In all 68 Species of riverine birds was record from the study area. All 30 Families of riverine birds were observed in the course of the study. Out of which, maximum of 08 Species were recorded from Ardeidae family followed by 05 species belong to Charadriidae family. According to the IUCN Red list (2021), 06 species was near threatened (NT) and 62 were least concern (LC) among the recorded riverine bird species, we recorded total 11 individuals the River Lapwing *Vanellus duvaucelii* in the Tapi and it was a significant record for the Tapi River, Melghat landscape. The study showed that this riverine ecosystem serves as suitable habitat for significant diversity and species richness of avian fauna. This was a preliminary work and a lot of observations and long term study is needed to further explore the bird diversity in the riverine habitat.

Keywords: Riverine birds, Diversity, Melghat Landscape, Amravati, Maharashtra.



Bacterial Infection on Major Carp *Catla* Fish from Lanjud Reservoir of District Buldhana (M. S.) India

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Fishes are the main element of aquatic communities, and they can directly affect the exploitation of all its communities as a protein source for human consumption. Pathogenic infection can strongly affect the rate of reproduction and survival capacity of fish. Therefore, knowledge of fish diseases has a great relevance through both from a scientific as well as an applied point of view. In this literature we attempt to determine the species of bacteria pathogenic to *Catla* fish collected from Lanjud reservoir. During this attempt two pathogenic strains of bacteria are examined from 30 defective samples of *catla* fish. Isolated bacterial species are *Aeromonas hydrophila* and *Vibrio cholerae*.

Keywords: Major Carp, *Catla*, Bacterial Infection, Lanjud Reservoir, Buldhana.

Diversity of Molluscan Fauna in Popatkhed Dam from Akola District of Maharashtra (India)

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In total, 2520 molluscan specimens were collected from the four sampling stations of Popatkhed dam in Akola district, representing two families and four species, four of which were gastropods. The identified gastropod species were *Bellamyabengalensis*, *B. dissimilis*, *Lymnaea acuminata*, and *L. luteola*. In a few gastropods, the highly dominant species were *Bellamya* and *Lymnaea acuminata*. Molluscs are environmental indicators that play a vital role in the maintenance of aquatic ecosystems by recycling nutrients and surviving as food for certain aquatic creatures. They are also a vital source of food for other animals like as fish, birds, mammals, and even humans. In an era of global biodiversity decrease, it is critical to investigate the current status of various biodiversity, which is why this attempt was done.

Keywords: Mollusca, Diversity, Akola, Maharashtra.



Study of Prevalence and Association of Some Human Morphogenetic Traits Expression with the Gender, Specific to North Maharashtra Region, Dist. Jalgaon

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Morphological traits are the physical characteristics of the individuals developed by the gene and their interaction. Nine morphogenetic traits include Earlobe attachment, Dimples, Rolling of the tongue, Chin, Hitchhiker's thumb, Handedness, Widow's peak, Crossing of the arm, and Hair nature were included in the study. Dominant and recessive traits are mentioned based on the literature review. Total 422 samples of students between the ages of 18-30 are randomly selected from the Jalgaon region. The Chi-square test of independent association is performed at 0.05 significance level for the evaluation of the association of morphogenetic trait expression with gender. The study's findings can be used in anthropological and medical-legal research.

Keywords: Morphogenetic traits, Phenotype, Prevalence.

Acute Exposure of Herbicide Pendimethalin Induced Histological Alteration in Gills of Freshwater Fish *Channa punctatus* (Bloch)

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Herbicides are utilized all across the world, accounting for around 47.5 percent of all pesticides used (De et al., 2014). Herbicides employed in agricultural fields end up in surrounding aquatic systems via surface runoff, where they have a negative impact on non-target aquatic creatures like fish (Gilliom, 2007). Pendimethalin [N-(1-ethylpropyl)-3,4-dimethyl-2,6-dinitrobenzenamine] is a widely used herbicide for landscape maintenance and residential lawn care to eliminate broad leaf weeds and grassy weed species in crop and non-crop regions. As a result, the purpose of our research was to see how the herbicide pendimethalin affected the histology of the important organs (gills) of the freshwater fish *Channa punctatus* (Bloch). Toxic effects were assessed using a static renewal test, and histological changes were observed microscopically. Acute dose (1/5 = 2.28mg/l) was given to the fish. The histopathological change in the gill showed necrosis and atrophy of primary and secondary gill lamellae. It is concluded that the herbicide compound induces histological alteration as a response to acute exposure to fish *Channa Punctatus*.

Keywords: Herbicide, Pendimethalin, *Channa*.



Check List of Agrobiont Spiders from Citrus Fields, Amravati Region, MS, India

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A study on diversity of agrobiont spiders was carried out at citrus fields in Amravati region, MS, India for one year. A total 56 species of agrobiont spiders were recorded belonging to 31 genera and 13 families from ground, litters, crevices and on vegetation. Among them 21.42% species belongs to family Araneidae and Salticidae each, 14.28% species belongs to family Lycocidae, 12.5% species belongs to family Oxyopidae, 7.14% species belongs to family Thomisidae, 5.35% species belongs to family Gnaphocidae, 3.57% species belongs to family Clubionidae, Erecidae and Philodromidae and 1.78% species belongs to family Mitergidae, Tetragnathidae, Therididae and Uloboridae. The spider population was in rich the fields, species richness and diversity was high during August to October.

Keywords: Agrobiont Spiders, Citrus Fields, Abundance, Diversity.

Malnutrition and Oral Health of Tribal Children of Melghat Region, Dharni, Dist-Amravati (M.S.)

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The pediatric dental survey with reference to malnutrition and primary teeth with caries because of different nutrition level was conducted in Melghat region specially among Korku tribe, involving 60 children (Both boys & girls) near about 24% children were chronically or acutely malnourished with dental caries and 76% of children were malnourished but did not have dental caries or problem. Children in this age group (i.e. 4-10 years) showed higher percent of carious teeth (14-24%) comparison with other malnourished children (46 to 76%) or from same age of group normal children. In present study, it is clearly indicated that, there is significant association between malnutrition and oral health of children in different age groups.

Keywords: Oral Health, Tribal Children, Melghat Region.



Status and diversity of water birds of Lawari Pond, of Eastern Vidarbha (India)

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The present study was undertaken to explore species avifaunal diversity, and their residential status in and around the study area. Lawari Lake (20°29'41.28"N and 79 °32'31.2"E) is located within newly approved Ghodazari Sanctuary by Government of Maharashtra. The shallow water reservoir with surrounding deep semi-deciduous tropical forest on one and paddy fields, presents unique agro-forest ecosystem which provides suitable feeding ground for wetland avifauna. During study period, spanning from, 2020 to Mar. 2022, wetland birds belongs to 56 species, 14 families and 7 orders. Maximum abundance recorded from Ord - Charadiformes followed by ord-Anseriformes and Peliconiformes. Among the observed community of waterbird, fam- Anatidae recorded maximum abundance followed by Fam-Ardeidae and Scolopacidae. Substantial number of winter migratory (WM) waders is responsible for rich diversity of water birds in the study, diversity indices for winter migratory (WM) shows steep decline in abundance of these birds, which is a matter of great concern. Results obtained in the present investigation of water bird indicates that, agro-forest ecosystem of Lawari Pond impacted the composition of water bird community, as 61% of total birds are either Winter Migratory birds or showing influx during winter season (R/LM/WM and R/WM/SM). Black headed Ibis and Darter are commonly observed during the study period and their population found relatively stable as against steep decline in the density pattern of Painted stork and Common Pochard is the matter of great concern.

Keywords: Diversity, Vulnerable, Threatened, Ghodazari, Lawari.

Studies on Web Structure of Three Spiders from Family Araneidae in Amravati District

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Araneidae spiders have world-wide distribution due to their diversified forms and habits. Web structure differs significantly among spider species from family araneidae. They are unique in their pattern of web architecture and silk production. This unique weaving ability of spiders attracted many scientists across the world. The gravity affects the designing of the web in the orb web waiver spiders. The spiders choose their web locations with respect to availability of food, vegetation and optimum temperature. The present study conducted in the Amravati District of Maharashtra, has made a significant contribution towards increasing knowledge of web structure of spider *Neoscona theisi* (Walcknaer 1841), *Cyrtophora citricola* (Forsk. 1775) and *Cyclosa hexatuberculata* (Tikader 1982) from the family araneidae.

Keywords: Web Structure, Spider, Behavior, Gravity.



Traditional ethno medicinal plants used as herbal remedies for hair disorder by tribal of Melghat region, Dist Amravati (M.S.)

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Herbal products are being used by people for their healthcare since immemorial. Though plenty of modern allopathic synthetic cosmetic products are available in market, people prefers the herbal product as they believed that they are safer and with no side effect.. Hair disorders are common and ever increasing problem in health care practices. Hair loss is a common dermatological problem that has been estimated to affect between 0.2 and 2% of the world's population. It is universal problem affecting both male and female. To overcome this global issue, documentation of ethno medicinal plants used by tribal of Melghat region on hair disorders such as hair fall, Dandruff, Baldness, Pre aging whitening of hair etc. has been carried out. Investigation reveals that different plant part of 12 medicinal plant species belonging to 11 families used for curing hair problems.

Keywords: Hair Care, Tribal, Ethnomedicene, Herbal Remedies, Hair Disorder.

Post Covid Symptoms in Hospitalized and Non-Hospitalized Patients with Covid-19: A Cohort Survey

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A substantial portion of people with COVID-19 subsequently experience lasting symptoms including fatigue, breathlessness and cognitive dysfunction (for example, confusion, forgetfulness, or a lack of mental focus and clarity). Some people also experience psychological effects as part of post COVID-19 condition many months after acute infection. Emerging evidence suggests that this condition, commonly referred to as *long COVID* but also known as post-acute sequelae of SARS-CoV-2 infection (PASC) or post-COVID-19 condition, could become a significant global health burden. Post COVID-19 condition can affect a person's ability to perform daily activities.

Most available data describe patients that have been hospitalized. Hence, we set out for exploring the incidence, of patients who were not hospitalized, had milder symptoms and were home quarantine but are facing post covid problems. The aim of this study is to describe and document persisting symptoms after COVID-19 in both hospitalized and non hospitalized patients.

Keywords: Covid-19, Long Covid, Sars CoV -2, Quarantine, Corona Virus.



Pathogenicity of Infected Edible Fishes from Wadali Lake, Amravati, Maharashtra

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Edible Fishes are one of the most important groups of vertebrates which provide free economic services to human beings in several ways. Fishing is one of the oldest professions of man. It has received much attention from the very beginning of the human history, as fish constitute one of the most nutritionally important items for human consumption. The data obtained in the present study is also important in variety of manners such as to know the present status of fish fauna in the local region, it is helpful for the researchers as well as fishermen's, to get an idea about the tolerance and diversity of fish found in Amravati region and choose exact variety of fish species for the culture so as to get maximum yield. Fishes are the primary source of protein along with omega three fatty acids. The fish protein is more easily digested in comparison to that obtained from other sources. One of the best ways to get Omega 3-fatty acids into the diet is to eat fish twice a week.

In order to know the pathogenicity of the isolates obtained from the naturally infected fishes, experimental infection trials were conducted in laboratory in model ecosystem developed in the laboratory by using aquaria of the size 48 x 18 x 18 inches. The fishes were selected as experimental fishes with average length of 15 cm and weight 100 ± 2 gm. Filtered sterile lake water (initially boiled and then cooled) was filled aseptically into each aquarium.

These fishes were placed in aquaria. Five fishes of each species were kept in each aquarium one species each. Experiment was repeated for six times.

The parasitic ability that is pathogenicity of the isolated different species of Fungi from naturally infected fishes was confirmed by conducting pathogenicity tests under laboratory conditions. *Saprolegnia parasitica* was found to be most virulent of all the experimentally inoculated Fungi, as its infection was noticed within eight and ten hours of exposure.

Keywords: Fresh water Fishes, Fungal Infection, Pathogenicity.

Diversity of Earthworm in Amravati region

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Biodiversity is responsible for maintaining the ecosystem service, in the soil earthworm represent largest component of biomass of soil ecosystem. It is also important to quantify the spatial distribution of earthworm of different agro ecosystem in order to understand the effect of abiotic soil process and to link earthworm abundance to the spatial distribution of macrospore in the soil. The information collected on the type of earthworm species and their abundance of different habitat may also provide useful information



on the efficiency and strength of that ecosystem. The review aims to assist people involved all aspects of management of agro ecosystem and importance and increases nutrient fertility of soil to obtain a broad knowledge of ecosystem service.

Keywords: Earthworm Diversity, Soil Variable Species, Abundance.

Biodiversity in India: Current Status, Threats and protection

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India, exhibiting great *diversity*, is one of the 17 mega-diverse countries in the world, and its diverse habitats and climatic conditions make it a rich source of biodiversity. The country is home to four biodiversity hotspots: Indo-Burma, Himalaya, Western Ghats-Sri Lanka, and Sundaland. These hotspots support a significant portion of the world's biodiversity, including 7.5% of the world's total animal species.

This chapter will provide a comprehensive account of the faunal diversity in India's biodiversity hotspots. The unique and diverse habitats in these hotspots support a wide variety of animal species, including many that are endemic to the region. Efforts will be made to highlight the significance of these hotspots for conserving global biodiversity and the challenges and threats they face.

By providing a detailed overview of the floral diversity in India's biodiversity hotspots, this chapter aims to contribute to a better understanding of the importance of biodiversity conservation in India and the role of these hotspots in supporting the country's rich biological heritage.

The following article presents an overview of our current understanding of India's richness, distribution, and variety of biodiversity. The field of biodiversity research encompasses numerous disciplines, such as paleobiology, taxonomy, ecology, and conservation biology. A particular focus is given to the areas of high biodiversity in India and the highly vulnerable mangrove ecosystem.

Keywords: Biodiversity, Current Status, Threats, Protection.

Impact of Pesticide Ethion on protein and Free Amino Acid Content in Fresh Water Fish *Clarias batrachus*

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Due to population explosion in our country, the needs of people increasing continuously including food. So there is inclined load on agriculture sector. In India, for increasing crop production insecticides, pesticide and fungicides used. These chemicals mix with water bodies of river, lakes, ponds and lastly the oceans and pollute the water. These pollutants damage various organs and disturb the physiological and biochemical processes of organisms. The affected animals produce internal stress and try to adjust it to these changes by changing the metabolic activities. The biochemical



studies gives an idea of accumulation of insecticides, pesticides, heavy metallic salts and some other chemical forms in the cells and tissue of the affected organisms. The important biomolecules are protein, carbohydrates and lipids.

Acute toxicity caused by the pesticides showed a significant positive correlation between dose and mortality. Rawat et al., 2002; Tiwari and Singh, 2009 observed that secondary metabolites of pesticides induce severe biochemical and enzymatic changes in aquatic organisms. The pesticide caused disruptive effect on protein, amino acid metabolism in aquatic animal. In present study, such biochemical alterations in the fresh water fish *Clariasbatrachus* observed due to exposure to pesticide Ethion upto 96 hours.

Keywords: Pesticide, Ethion, protein, Free Amino Acid, Fresh Water Fish.

The avifaunal diversity of two protected areas in the semi-arid region of Northern Gujarat

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The diversity of birds and the environmental conditions of any area are closely related because birds serve a variety of roles in the ecosystem and are thus known as ecological indicators. Out of more than 1335 species of birds found in India, or 12.5% of the world's total avifaunal diversity, 605 bird species have been recorded in Gujarat. The purpose of the current study is to determine the bird diversity in the Jessore and Balaram-Ambaji wildlife sanctuaries in Banaskantha district of Gujarat, with respect to their feeding guilds. Direct observation and the point count method were used to collect data, which was done over the course of 10 visits throughout each of the three different seasons. A total of 202 bird species, representing 20 orders and 66 families, were reported during the two-year survey, accounting for 33.39% of Gujarat's avian diversity. Among the species recorded, 190 species are Least Concern, five species are Vulnerable and five species are Near Threatened. Endangered species such as the Egyptian Vulture and the Steppe Eagle have also been recorded in the area. Carnivores (33%), insectivores (32%), and omnivores (24%) make up the three dietary guilds that are seen most frequently in bird species. The remaining 11% are composed of herbivores, frugivores, graminivores, and nectarivores. Bird species' feeding habits indicated the amount of utilization in that area because they were in sync with their habitats. The diversity of feeding guilds suggests a range of viable food sources, which ultimately reflects the quality of habitat.

Keywords: Avifaunal Diversity, Northern Gujarat, Vulnerable, Endangered Species.



Study on Effect of Ant Diversity on Physicochemical Alterations in Mound Soil in Rural Areas near Nagpur City

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Ants are social, mound-building insects. During mound construction and food harvesting, they cause disturbances to grassland ecosystems that modify the structure and functioning of the plant community. An ant represents a unique focal group having the potential to be used as a biological indicator. Soil homogenization and mounding are mainly influence the vegetation with below-ground parameters. Also, the movement of particles from lower horizons to the surface area by ant aids affects the mixing of organic and mineral fractions of the soil to increase fertility. The maximum population of ant species affects one physical and biological properties of soil greatly. Ants are important in below-ground processes through the alteration of the physical and chemical environment and through their effects on plants, microorganisms, and other soil organisms. The feces of ants are the basis for the formation of soil aggregates and humus, which physically stabilize the soil and increase its porosity to store nutrients. In the present study, we compared ant mound soil collected from different regions of Nagpur city to study the inclined proportion of soil micronutrients with the species richness of the plant population. In the present study, some ant species like, *Crematogaster rothneyi*, *Solenopsis invicta*, *Pheidologeton indica*, *Iridomyrmex anceps* and *Camponotus compressus* are studied by focusing nest building activity. These species involved in creating highly concentrated patches of soil nutrients could affect biogeochemical cycling rates and plant community dynamics. So the present study based on the presence of the above ants species glaringly served to be induced an increasing ratio of soil micronutrients which may be in the future use as the bio-fertilizer for better plant biomass.

Keywords: Bio-indicators, Camponotus, Solenopsis, Crematogaster, Pheidole, Irydomyrmex, Physicochemical.

Study of Diversity of Moths in Urban Areas of Khamgaon City, Buldhana (M.S.)

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Moths belong to the order Lepidoptera and this type of fauna are easily affected by slightest change in the environment hence keeping in view moths can be used to check the minute change of environment can be caled as bioindicators of environment. Taking a chance to investigate environmental healthall possible efforts were carried out in this work to list and unfold this hidden fauna of urban areas of Khamgaon city and some surrounding areas. Collection of Moth was carried out from June 2022 to August 2022. A total unnumber of 13 moths specimens were collected by using simple light trapping method operated from dusk to dawn by using photographed method. The moths were identified to Family level. Families Sphingidae, Geomitridae, Erebidae, Noctuidae, and Geometridae were recorded. Family Eredae dominated among all 5 families in diversity and abundance

Keywords: Lepidoptera, Bioindicators, Simple Light Trapping, Erebidae, Urban Areas.



Diversity of Beetles in and around Dnyanganga Sanctuary of Buldhana District Maharashtra, India

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In the present communication, concerted efforts were made to study diversity of beetles in and around Dnyanganga Sanctuary of Buldhana District Maharashtra, India. Surveys for collection of beetles of different habitats of the Buldhana region of Maharashtra were conducted during October 2020 to December 2022. Beetles are important to humans and our environment. Some beetles are insectivores or pollinators - these beetles help plants & farmers. By removing the dung, they prevent populations of parasitic flies from breeding in the fresh faces of mammals. During the present surveys and collection a total of 120 species distributed over 80 genera belonging to 22 families of beetles were recorded. The Shannon-Weaver (2.29) and Simpson Diversity Indices (0.79) revealed rich diversity and abundance in the region under study.

Keywords: Diversity, Habitat, Environment, Insectivores, Pollinators, Abundance.

Status of Faunal Biodiversity Conservation in Buldhana Region Of Maharashtra, India

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Forests and wild animals are the major part of an ecosystem. Wild animal form a great part of the food chain, responsible for maintaining a balance in the ecosystem. Maharashtra, the third largest state is one of the most industrialized and urbanized state of India. The Vidarbha region, northern part of Maharashtra, features dense forest. It is home to several wildlife sanctuaries and national parks. Environment in Maharashtra supports excellent and varied resources. Maharashtra is the house for a large number of animal species including the Tiger, Crocodile, Bison, Neelgai, Wild Deer, Sambar and rare migratory birds. Buldhana region is well-known for its rich biodiversity, varied environment and geological condition.

This study reveals the status of faunal biodiversity conservation in Buldhana region.

Keywords: Food Chain, Environment, Biodiversity, Ecosystem, Forest, Species, Conservation.



Fish are Important for Ecological Balance as they Transfer Nutrients, Minerals and Energy to Maintain Aquatic Equilibrium

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The snakehead (*Channa orientalis*) is one among the species of snakehead fish found in freshwater habitats. They are predatory fish that feed on plankton, insects, and sometimes small amphibians. Fish are important for ecological balance as they transfer nutrients, minerals and energy to maintain aquatic equilibrium and terrestrial food webs are interlinked through migrations as well. The snakehead fish (*Channa orientalis*), is locally known as Dhoke in Maharashtra India. It is fresh water fishing South and Southeast Asian countries and considered as a source of high-quality protein and traditional remedy of sickness. Snakehead is not only the healthy diet to eat and relish but are often used as medicine for various diseases. They now compose a large portion of aquatic food. Fish farmer's economy is well dependent on their commercialization and subsistence hunting on Fish and it forms a boon for them. In addition to this, they are also caught for recreational purposes and exhibited at public and tourist spots, thus forms boon to country's economy. Fish have been utilized as a food source especially for protein diet throughout history. This has given rise to a new branch of farming called Aquaculture.

The snakehead (*Channa orientalis*) is one among the species of snakehead fish found in freshwater habitats. They are predatory fish that feed on plankton, insects, and sometimes small amphibians. Fish are important for ecological balance as they transfer nutrients, minerals and energy to maintain aquatic equilibrium and terrestrial food webs are interlinked through migrations as well. Fish extinction can have major ramifications for ecological productivity if not protected from instant threats due to Anthropocene activity; hence affect freshwater ecosystems and world food webs as well. Fish are therefore considered important food source nationally and internationally and also a major balancing wheel of malnutrition. They serve as primary source of some important food items fortified with proteins, vitamins and minerals.

Results of the present study demonstrated that periodic feed supplemented with some natural diet like madhuca extract in our experiment markedly influenced the activities of the digestive, metabolic and serum enzymes of *Channa orientalis*. The results of this study could be used for monitoring the health and studying the physiological properties of *Channa orientalis*. However, additional investigations should be carried out on the effect of capturing and stressful conditions on serum enzymes activities. So, fish are important for ecological balance as they transfer nutrients, minerals and energy to maintain aquatic equilibrium.

Keywords: *Channa orientalis*, Freshwater Fish, Ecological Balance, *Channa orientalis*.



Prevalence of Sickle Cell Anemia in Akot region of Maharashtra

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Sickle cell anemia is a hereditary disease passed from generation to generation. It is a haemolytic anemia constituting one of the important and majorly increasing health problems in a society. The particular study of this topic was initiated to ascertain the prevalence of sickle cell anemia by using different variables in Akot region of Akola district, Maharashtra. It is most commonly occurring genetic disorder consisting of 5 percent of total world's population. Different methodologies i.e., screening camps which are particularly known as Survey method were held in different regions of Akot, among different communities; accompanying observational study and data statistics. It is a lifelong condition which is at most incurable hence, needed to be looking after thoroughly. As a result, it was found that overall prevalence of sickle cell anemia was high in backward communities. The numbers of carriers were found to be high than the number of sufferers. As per studies regarding this topic, it is very crucial to create awareness among people through various medium for better and safe future. The main objective to study this topic was to create awareness about disease, severity and increasing the rate of sickle cell anemia.

Keywords: Sickle Cell, Anemia, Genetics, Disorder, Maharashtra.

Study of Birds Diversity and their Conservation at Koradi Dam of Buldhana District, Maharashtra

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Study on bird species diversity and distribution is important for conservation efforts. Avifauna is one of the most important ecological indicators to elevate the quality of habitats. Most of the birds are useful to mankind. Birds plays an important role in maintaining the ecological balance, Due to increase in urbanization and various anthropogenic activities, diversity and distribution of bird's species is on declining trend all over the globe. The present study was conducted on Koradi dam, district Buldhana in Maharashtra for one year, starting from November2020 to November2021. The study reveals a rich avian diversity and a total of 28 species of birds belonging to 11 families were identified by using standard point count methods. Out of the 28 birds species observed, the common bird species were Black Drango, Corvus Crow, House Sparrow, Common Kingfisher. As the Dam is having abundant food, rich aquatic vegetation and supports variety of aquatic fishes makes it suitable for birds and attracts many migratory birds in the particular region during the winter.

Keywords: Bird Species, Distribution, Diversity, Aquatic, Koradi Dam.



Sublethal Malathion induced biochemical alterations in liver of major Carp *Labeo rohita*

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Malathion is an insecticide of group organophosphorus showing strong insecticide properties accompanied by low toxicity for vertebrates. The present study shows the malathion induced alterations in the biochemicals of liver of major carp *Labeo rohita* exposed to sublethal dose for 30 days. Glycogen, Protein and Cholesterol of liver was estimated on 10th, 20th, and 30th day. The liver glycogen was found to be depleted significantly after 10 and 20 days of exposure. However, it increases after 30 days. Liver protein was elevated after 20 days of exposure, but after 30 days of treatment it depleted significantly. The fish exhibited elevated liver cholesterol during the exposure of 30 days.

Keywords: Malathion, *Labeo rohita*, Glycogen, Protein, Cholesterol.

Nickel induced Histopathological alterations in the Female Reproductive Organs of freshwater fish, *Channa gachua* (Ham.)

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Industrial effluent containing heavy metals, on entering aquatic environment causes histopathological disturbances in the fish. The present study deals with the toxic effect of heavy metal - Nickel (Ni) as NiSO₄ on the Female Reproductive Organs – Ovary of fresh water fish, *Channa gachua*. Ovary was examined in the 96 hours LC₅₀ acute test. Histopathological examination of Ovary revealed marked pathological changes like rupture of ovigerous lamellae, rupture, degeneration and absorption of growing oocytes, degeneration and necrosis of connective tissue, formation of atretic follicles with suppression of oocyte maturation, rupture of blood vessels, thus affecting the process of reproduction in the female fishes.

Keywords: Nickel, Ovary, Histopathology, *Channa gachua*.



Evaluation of Anti-Fertility Activity of Ethanol Extract of *Achyranthes aspera* on male Albino Rats

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In the present study, anti-fertility effect of ethanol extract of *Achyranthes aspera* plant was observed in male albino rat. After treatment of 200mg/kg body weight for 15 days intoxicated to rat, it was observed the relative weight of the testes and epididymis were decreased. The epididymis sperm count, motility and sperm abnormality were reduced significantly in treated rats. The results of the present study concluded that, ethanol extract of selected plant shows antifertility effect on male rat which might result in a male sterility.

Keywords: Anti-fertility, *Achyranthus aspera*, Sperm Count and Motility.

To Study the effect of herbicide on reproductive hormone of Male Albino Rat

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The effect of herbicide glyphosate on reproductive hormone of male Albino rat. The animals were exposed on acute exposure of the glyphosate for the present study. The Testosterone, FSH, and LH hormone level get decline with respect to normal. The main reason for the negative effect of these hormones on the testes' histological structure which is damaged due to glyphosate and consequently affects the Leydig or interstitial cells' number and function. So, It is concluded that herbicide glyphosate either in low or high concentration have very toxic effect on reproductive hormones.

Keywords: Glyphosate, Reproductive Hormones, LH, FSH, Testosterone.

Faunal Diversity of Beetles (Order- Coleoptera) in the Pohara Forest, District Amravati (M.S.) India.

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The order Coleoptera, is the largest order of insect consisting of the beetles and weevils. They occur in nearly all climates. They may be divided into four groups: the first three, the Archostemata, the Adephaga, and the Myxophaga, contain relatively few families; the majority of beetles are placed in the fourth group, the Polyphaga. They were identified and classified by observing wing number, wing shape and venation, structure of antennae, legs or tarsi, mouthparts, etc. Identification was made with the help of keys provided by Zoological Survey of India, Kolkata (Jonathan et al. 1986), and bug guide net open-source platform on web.



The Pohara reserve forest is situated towards the East of Amravati city, (M.S.) India Pohara range of hills at 77° 54' E longitudes and 20° 54' N latitude. The study area is near Woods Water Park Resort and is about 8 Km. away from the College.

The objective of the present study is focused on the assessment of the Beetles diversity. A total of 12 species of beetles under 04 families were recorded during the month September to December.

Keywords: Coleoptera, Diversity, Pohara Reserve Forest, Amravati.

Species Richness of Ants (Hymenoptera-Formicidae) in Cotton Crop Fields of Amravati, (M.S.), India

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The diversity of ant in four selected cotton fields of Amravati was explored during June to November of 2018 and 2019. 17 species of ant representing 3 sub families, Myrmicinae, Formicinae, Dolichoderinae were observed during the investigation period. The ants were collected using a combination of pitfall traps and manual pick. August was the month with the highest ant species richness in the investigated crop fields, when cotton plants were blooming with flowers and developing balls. The evenness index of the ant population in the chosen fields was nearly the same for both research years. The Shannon- Weiner Diversity Index reveals the potency of crop fields in Amravati to support the ant diversity and species richness. Ants are the important components of the agricultural ecosystem and Cotton, the major Kharif crop of the region get benefited by the ant population.

Keywords: Ant diversity, Cotton crop fields, Myrmicinae, Formicinae, Dolichoderinae.

Fishes assemblage of Major Rivers and their Tributaries in the Amravati District, Maharashtra

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Fishes are important bioindicators of water quality and play a very important role in maintaining the aquatic ecosystem as they provide food for several land water species and purify water by consuming the harmful larvae. In the age of global decline of aquatic biodiversity, it is necessary to study the present status of different biota, and hence this attempt was made. The present study was carried out on fishes diversity from the major rivers and their tributaries in the Amravati district namely the Wardha river, Purna river, Chandrabhaga river, Tapi river and Sapan river as these rivers possess huge potential for various biota. The study was conducted from November 2022 to January 2023. Fishes were sampled with the help of local fishermen and nearby fish markets as fish capturing was regularly practiced there.



Photographic shreds of evidences were recorded with the help of GPS applications. The species identification was done with the help of Standard sources available. During study 44 species of local riverine fishes were recorded and all possess the potential for edible value. Out of those, 14 species were enlisted from the Wardha river, 10 species were recorded from the Purna river, 8 species were found in the Chandrabhaga river and 8 species were recorded from the Tapi river, and 4 species from the Purna river. Out of these 44 species, 15 species were found common at various study sites, Spiny Eel (*Mastacembelus a. armatus*) was found at all five rivers during the study, while 29 fishes species were enlisted different and from those, 7 species were endemic to the Wardha river, 3 species were only found in Purna river, 3 species show endemism to the Chandrabhaga river, 7 species were only found in the Tapi river. The obtained data revealed that the Tapi river and its tributaries showed more number of endemic species than the Wardha river. A keen observation of species endemism revealed their preference for the particular rivers due to supporting ecological parameters present there. This was the preliminary study of the riverine fishes in the Amravati district but there is an immense need for extensive and exclusive exploration of riverine fish diversity in the district by considering their habitat ecology to get an idea about their distribution, present status, and tolerance in the particular river.

Keywords: Fishes, Diversity, Endemism, Major Rivers, Amravati, Maharashtra.

Zooplankton Population in Sonala Dam, Sonala, Dist. Washim, (M.S.)

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Zooplankton Population in Sonala dam, Sonala, Dist. Washim, Maharashtra. Sonala dam is an earthen dam, constructed by irrigation department of Maharashtra Govt. Zooplankton diversity was studied from this dam which is one of the most ecological parameters as these are the intermediate link between phytoplankton and fish. They play a significant role in transferring energy in aquatic ecosystem as primary consumers and can be used as indicators of trophic phase of a water body. The study area was divided in to six sampling stations to cover the whole dam. Monthly sample were collected by filtering twenty liter water sample through standard plankton net of bolting silk cloth with 64 μ mesh size and the concentrated sample were collected in 10 ml distilled water and were preserved in lugol solution and 4% formalin and observed. Population abundance and Percentage of zooplanktons was in the order of Rotifer > Cladocera > Copepoda > Protozoa > Ostracoda. Rotifers (27.90%), cladocera (16.76%), copepod (15.49%); protozoan (15.06%); ostracods (13.28%);

Keywords: Zooplankton, Sonala Dam, Indicators, Ecosystem.



To explore the population genetics of Kashmir Markhor (*Capra falconeri cashmiriensis*).

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The “Markhor” (*Capra falconeri*) largest steppe mountain goat native to Karakorum range, Central Asia, and Himalayas is among the endangered mammal species, and several conservation measures, including ex situ breeding, are implemented to prevent their extinction. The wild goat population is alarming due to habitat fragmentation, illegal trophy hunting, and disturbance, together with forage competition from domestic livestock and cross border intervention. This study basically engaged to amplify Mitochondrial DNA (mtDNA D-loop) by using non-invasive method of DNA extraction. In order to conserve the genetic diversity of Markhor, the heterozygosity, effective population size and mean allele number will be measured. Diversity indices approach will be employed to measure the population genetic of the Capra species.

Keywords: Markhor (*Capra falconeri*), Endangered, mtDNA And Population Genetics.

Effect of *Arnebia benthamii* as a feed additive on growth and disease resistance against *Aeromonas hydrophila* in fresh water fish *Channa punctata* (Bloch).

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The effectiveness of an ethanolic extract of *Arnebia benthamii* on growth and disease resistance in the freshwater fish *Channa punctata* against the bacterial pathogen *Aeromonas hydrophila* infections was investigated in this study for 42 days. Fish were given a dry meal containing 0 g/kg (control), 10 mg/kg, 20 mg/kg, and 40 mg/kg of *A. benthamii* ethanolic extract, the fish's growth was recorded at 0 days, 14 days, 28 days, and 42 days. In challenge test *A. hydrophila* was introduced to the fish after 42 days of post feeding diets. Over the course of 10 days after infection, survival and mortality percentages were recorded. The results reveal that fish given an ethanolic extract of *A. benthamii* grew enormously (436.95 ± 9.1 % weight gain and 3.51 ± 0.1 specific growth rate in 40 mg/kg feeding diet) compared to the control groups, the survivability was higher in experimental diets (85% in 40 mg/kg diet group as compared to control group where survival rate was only 5% recorded). The findings show that an ethanolic extract of *A. benthamii* stimulates growth and promotes disease resistance in snake-headed fish *C. punctata* when infected with *A. hydrophila*.

Keywords: *Arnebia benthamii*, Growth, Disease Resistance, *Aeromonas hydrophila*, *Channa punctata*.



Significant Sighting of Avian Fauna in Upper Wardha Reservoir, Morshi, District Amravati.

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Aves is one of the best class of living organism. They are important bio-indicator and play important role in balancing ecosystem. The present study was carried out to determine the significant birds of Upper Wardha Reservoir. All these birds were seasonal visitors, majority of them were rare to this area. Arrival of these birds to this area was important for the study of habitat and vegetation of this area.

We have carried out this study for the period of one year, from January 2022 to January 2023. For the study we have selected five stations. Each station was visited four times in month and we have used point count method to collect the data. We have recorded more than 150 species of birds out of that sighting of 15 species of bird were found to be significant and rare for the upperwardha reservoir which includes, White fronted geese (*Anser albifrons*), Grey lag geese (*Anser anser*), Bar headed geese (*Anser indicus*), Black headed gull (*Chroicocephalus ridibundus*), Brown headed gull (*Chroicocephalus brunnicephalus*), Pallas's gull (*Ichthyaetus ichthyaetus*), Blue tailed bee-eater (*Merops philippinus*), Ruff (*Philomachus pugnax*), Dunlin (*Calidris alpina*), Black tailed Godwit (*limosa Limosa*), Glossy Ibis (*Plegadis falcinellus*), Greater Cormorant (*Phalacrocorax carbo*), Orientle Pratincole (*Glareola maldivarum*), Straited heron (*Butorides striata*), Osprey (*Pandion haliaetus*) etc. Out of the 15 species of birds, IUCN status of Black tailed Godwit was near threatened and remaining 14 were least concerned. On Upper Wardha reservoir, we have sighted White fronted geese and Grey lag geese for the first time. White fronted geese and grey lag geese are vagrant irregular visitor. The sighting of Pallas's gull was rare for this area. The sighting of Orientle pratincol was occasional for this area. Out of these 15 birds species 13 were visited for feeding purpose and remaining two (Blue tailed bee-eater and Orientle pratincole) visited for breeding purpose. These birds play a significant role in monitoring ecological balance. The visit of these birds to this study site indicates that this reservoir and its catchment area serves as best feeding and breeding ground for them.

Keywords: White Fronted Goose, Significant Avian Fauna, Upperwardha, Amravati, Maharashtra.

Corridor: A Ladder for Conservation or a Snag for Human-Sloth Bears Conflict

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The non-protected forest of Chhota Udepur with fragmented ends is connected by Ratanmahal and Jambughoda Wildlife Sanctuaries in Central Gujarat. These fragmented ends are occupied with agricultural land interspersed with settlements. With a remarkable rise in the population of sloth bears;



103 human-bear attacks are reported from 2008-2020 in the study area. Agriculture is the primary occupation here and locals visit forest for the collection of natural resources due to which 70.87% males and 29.12% females were attacked. The objective here is to monitor and evaluate the corridor area alongside interacting with locals to minimize the hostility towards bears. For these, sign surveys were carried out to check the presence of sloth bears and camera traps were deployed to monitor the sloth bear movement. These will further help mark the area utilized by bears and their temporal overlap with the locals. 328 sloth bear signs are collected from 741.4 sq. km and 152 sloth bear photo captures are collected in 226 trap nights indicating a significant bear movement in the area. 663 locals were interviewed to understand their knowledge and perception about bears and 120 bear attack victims were interviewed to understand their interaction with the sloth bear. Locals share forest resources with the bears, which eventually leads to negative interaction and to reduce such accidents it is important to educate the locals about the prevalent attacks. There is a need to inculcate tolerance among the locals to co-exist with bears and at the same time there is a need to address and minimize the sloth bear attacks and monitor the sloth bear movement in the area.

Keywords: Corridor, Conservation, Human, Sloth Bears.

Behavioral Study of Asiatic Wild Ass, *Equus Kiang* using Non-Invasive Sampling Approach from Ladakh Region

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The Asiatic wild asses (*Equus hemionus* and *Equus kiang*) like all other equids belongs to the family-Equidae and Genus-*Equus*. The genus includes all the extinct and extant horse-like species. According to IUCN, the genus *Equus* includes species like; domestic horse (*Equus caballus*), przewalski's horse (*Equus przewalski*), African wild ass (*Equus africanus*), Asiatic wild asses (*Equus hemionus* and *Equus kiang*), mountain zebra (*Equus zebra*), plains zebra (*Equus quagga*) and Grevy's zebra (*Equus grevyii*). Three subspecies of the *E. kiang* have been described on the basis of their geographical distribution, namely *E. k. kiang*, *E. k. holdereri* and *E. k. polyodon* corresponding to the Western, Eastern and Southern kiang.

From the distribution point of view *Equus kiang* is endemic to the Tibetan plateau and found in the provinces of China and adjacent border areas like India, Nepal and Pakistan. In India, *E. kiang* is found only in the Changthang region of the UT of Ladakh where it is conserved in the Changthang Wildlife Sanctuary extending in an area of 4000 sq km.

The subspecies *E. k. kiang* (western kiang) is the only species found in Ladakh. IUCN has recognized the species *E. kiang* as "Least Concern" but the sub species (*E. k. kiang*) found in Ladakh has been categorized as "Data-deficient", i.e., they don't possess enough information for any proper conservation protocol to be framed and hence need immediate and urgent attention.



In order to study this robust species, we surveyed the various habitats of kiang and also used a non-invasive approach to collect their fresh fecal samples to check whether this species could be typed at the genetic level using various microsatellite and mtDNA markers. The permission to collect the fecal samples was sought out from the Principal Chief Wildlife Conservator Leh. This is the first attempt to study *E. kiang* from India using molecular ecology methodology.

Keywords: Asiatic Wild Ass, Equus Kiang, Ladakh, Non-Invasive Genetic.

Assessment of Physico-Chemical Properties of Benthic Water from Chhatri Talav in Amravati.

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Water is the main constituent of Earth's streams, lakes, oceans and fluid of most living organisms. Water quality is important because it directly affects health of not only human being as well as animals. Water quality monitoring is directly and indirectly related with chemistry, biology, statistics and also economics. This paper describes the analysis of water quality in relation to physico-chemical parameters of different samples of the Chhatri Talav water body in Amravati city. This lake is beautiful which invokes a natural attraction but there is need to develop these places from water quality point of view. Water quality index provides a single number that express overall water quality at certain location. Various physicochemical parameters, such as water temperature, pH, humidity, free Co₂, total solid, dissolved oxygen, Total alkalinity, Total hardness, were studied. The results revealed that there was significant seasonal variation in some physicochemical parameters and most of the parameters were in normal range and indicated better quality of lake water. This study is also intended to check the pollution load of water bodies and to assess the usability of water therein for drinking, recreation and other uses if needed in future. The objective of study is monitoring the quality of surface water in order to protect our waterways from pollution.

Keywords: Surface Water, Middle Water, Muddy Water, Physico-chemical parameters, Chhatri Talao, Amravati, Maharashtra, India



Nesting Bird survey in Wadali Garden, Amravati, Maharashtra

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Birds are biodiversity indicators and they play a vital role in biodiversity as well as contribute to the expansion of trees with the help of the dispersion of seeds. The bird needs vegetation for survival and due to the green patches in urban areas bird diversity and their existence is sustained in the urban area. The study was carried out in November, December and January 2022-2023 in Wadali garden area of Amravati City. Wadali garden is one of the famous and oldest places in Amravati and it spread near about 15 hectares near Pohara-Malkhed reserve forest. The study area is richly diversified with patches of forest, old garden, Bamboo garden and wetlands. Monthly four visits were made in the study area and Line Transect and Point count methods were used for the bird census during the bird survey. Nesting tree characteristics were also noted viz., tree height and nest height, position of nest on tree and orientation of nesting cavity. Observation and Identification were done using Binocular. And photographic documentation was made by using Nikon camera kit and the location was confirmed by Garmin GPS. A total of 49 nests of 12 bird species were recorded in the study area. Out of 49 nests, 13 nests were found in the cavity of trees, 35 nests were found on branches of trees and one nest was found hanged to a branch of the tree. These all nests were recorded on 14 species of trees including indigenous and exotic plant species in the study area. Out of these 14 plant species, 8 plants were indigenous and 6 plants were exotic. Indian Grey Hornbill and Alexandrine parakeet nesting records in the garden was the significant outcomes of the study. The present study revealed that the Wadali garden is a very important area in Amravati city for roosting, feeding and nesting of birds. Therefore, gardens, open spaces and green patches are very essential for bird species' existence in the urban ecosystem.

Keywords: Birds, Nesting, Survey, Wadali Garden, Amravati, Maharashtra.

Preliminary Study on Occurrence, Foraging and Roosting of Black Headed Ibis at Sawner and Nearby Water Bodies of Nandgaon Khandeshwar Tehsil

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Nandgaon Khandeshwar is a tehsil of Amravati district located 35 kilometre away from City of Amravati. The Nandgaon tehsil comprise of several small villages spreading 787 km. The area of nandgaon is also blessed by few wetlands both man-made and natural. The village sawner is one of the villages of Nandgaon tehsil. The sawner villages comprise of less population and agriculture is practised. The sawner village also have two wetlands which are surrounded by agriculture lands. The regular visit at this wetlands have helped us to site the Black necked Ibis *Threskiornis melanocephalus* a near threatened species as per



IUCN data suggesting nearly 10000-19999 individual world-wide. This study aims to understand the frequency of occurrence, number of individual, foraging sites and roosting sites of the black necked ibis from sawner village wetland.

Keywords: Black necked Ibis, Wetland, Roosting.

Larvicidal potential of metal nanoparticles derived with the help of plant extract.

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Dengue fever causes mortality and morbidity around the world, specifically in the Tropics and subtropics regions, which has been of major concern to governments and the World Health Organization (WHO). Dengue fever or dengue hemorrhagic fever is the most prevalent viral disease caused by dengue virus a family of flavivirus transmitted through *Aedes Aegyptus* mosquito. Approximately 2.5 billion people world wide affected by this virus. As there are no synthetic drugs available, several strategies have been tried to control the proliferation of *A. aegypti* using plant crude extract, physical, biological, and chemical control measures. Other methods are currently under research and development, amongst which the use of nanotechnology has attracted a lot of attention of the researchers in relation to the production of more effective repellents and larvicides with less toxicity. Mosquito larval control using larvicidal agents is a major component in the control of vector borne diseases. Plant and silver Nps as potential larvicides are considered as viable and preferred alternative in the control of the mosquito species at the community level.

Keywords: Silver Nanoparticle, Anti Dengue Activity, Vector, Larvicidal Activity.

Review of Polycystic Ovarian Syndrome (PCOS) Awareness among Adolescent Girls and Young Women

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Polycystic ovarian syndrome is the most common endocrine problem in adolescent girls and women of childbearing age. PCOS is a common disorder, but due to lack of knowledge, women often delay diagnosis and treatment. PCOS is a condition related to a hormonal imbalance that causes an overproduction of androgens (which are male sex hormones) in the ovaries. The most noticeable features of PCOS are menstrual irregularities (oligomenorrhea), anxiety, acne, mood swings, no ovulation, baldness / thin hair, infertility, amenorrhea, depression, hyperpigmentation factors, irritation, excessive facial and body hair (hirsutism), enlarged ovaries with cysts. Several studies have looked at the impact of PCOS on mental



health. According to the World Health Organization, PCOS has affected 116 million women worldwide. The main aim of this review is to highlight effective methods to increase PCOS awareness and education in young age groups, which would help promote early diagnosis of the disorder and reduce the risk of many long-term health complications

Keywords: PCOS, Women, Health, Ovaries, Girls.

Bacterial Resistance Nature of *Hippasa holmerae* Spider Silk.

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Two distinct bacteria were examined to determine the antimicrobial effects of the spider's web of *Hippasa holmerae*. Three different solvents were prepared by dissolving web of *Hippasa holmerae* in Acetone, Methanol and Ethanol as extract, used to study antibacterial nature. After 24 hours, extract of solvents showed a zone of inhibition against the two microorganisms *E. coli* and *S. aureus*. In Methanol extract zone of inhibition for *E. coli* and *S. aureus* was observed as 14 mm and 12 mm respectively. Acetone extract showed zone of inhibition for *E. coli* and *S. aureus* as 16 mm and 14 mm respectively, however Ethanol showed antibacterial nature against *S. aureus* with zone of inhibition of 10 mm and for *E. coli* antibacterial nature was observed.

Keywords: *Hippasa holmerae*, Spider Silk, Antimicrobial Nature, *E. coli*, *S. aureus*.

Seasonal Zooplankton Diversity Aspects of Lower Dnyanganga Dam near Khamgaon

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Planktonic life plays very important role in aquatic ecosystem. The utility of zooplankton for ecological bio monitoring of water bodies also helps in the analysis of water quality parameters and sufficiency of water quality for various uses. This study is evaluating the seasonal zooplankton diversity of Lower Dnyanganga Dam at Nimkawala Tahasil Khamgaon located at Buldana District of Maharashtra. This dam is an outflow of upper Dnyanganga dam and surface runoff from surrounding areas. The zooplankton diversity was assessed from December 2020 to May 2021 monthly. Water samples were collected from four sites of the dam with the help of local fishermen. Standard method was used qualitative analysis of zooplankton. About, 13 species of zooplankton were recorded including 13 species belonging to 5 orders viz. Cladocera, Calanoida, Cyclopoida, Ploima and Podocopida and noted that the Arthropods were the most dominant.

Keywords: Biodiversity, Lower Dnyanganga, Zooplankton, Biomonitoring, Khamgaon.



Global Climate Change and Its Impact on Indian Agricultural Pattern with Prime Focus on Productivity.

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Climate change is one of the major challenges of our time and adds considerable stress to our societies and to the environment. This paper estimates the economic impact of climate change with prime focus on productivity on Indian agriculture. I estimate the effect of random year-to-year variation in weather on agricultural output using a 40-year district-level panel data set covering over 200 Indian districts. I find that projected climate change over the period 2010-2039 reduces major crop yields by 4.5 to nine percent. The predicted medium-run impact is negative and statistically significant. From shifting weather patterns that threaten food production, to rising sea levels that increase the risk of catastrophic flooding, the impacts of climate change are global in scope and unprecedented in scale. Without drastic action today, adapting to these impacts in the future will be more difficult and costly. This overview deals with the concept of Global Climate Change, the associated terms, causes, consequences, solutions and its potential impact on Indian agriculture. It shows the need to act urgently if we are to avoid an irreversible build-up of greenhouse gases (GHGs) and global warming at a potentially huge cost to the economy and society worldwide. Therefore, addressing climate change requires an “unprecedented level of cooperation, not only between countries, but also between different levels of Governments, private sector and individuals. The long-run (2070-2099) impact is dramatic, reducing yields by 25 percent or more in the absence of long-run adaptation. These results suggest that climate change is likely to impose significant costs on the Indian economy unless farmers can quickly recognize and adapt to increasing temperatures. Such rapid adaptation may be less plausible in a developing country, where access to information and capital is limited.

Keywords: Climate Change, India, Agriculture, Agricultural Output.

Preliminary Study Check List of Beetles (Order-Coleoptera) from foot hills region of Southern Satpuda Range, Morshi, Amravati, Maharashtra-444602 (India).

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Present study reported that 36 species were from foot hills region of Southern Satpuda Morshi, Dist. Amravati. two sub-order, Adephaga and polyphaga and Eight Families. form Order-Coleoptera Sub-order Adephaga includes family Carabidae which represent 10 species. Sub-order Polyphaga includes seven (7) families namely Scarabaeidae, Coccinellidae, Lampyridae, Chrysomelidae, Meloidae, Elateridae and Cerambycidae. Sub-order Polyphaga represents 26 species out of which family Scarabaeidae contains 16 species, Coccinellidae includes 3 species, Lampyridae contains 2 species, Chrysomelidae 2 species, Meloidae, Elateridae and Cerambycidae represents only one species each. Most



diverse family is the Scarabaeidae containing 16 species; list diverse families are Meloidae, Elateridae and Cerambycidae including only one species each. Out of two sub-order studied, the dominant sub-order is Polyphaga (26 species) as compared to the sub-order Adephegna (10 species). The most dominant families studied were the Scarabaeidae which include 16 species, Carabidae which include 10 species. Study was conducted during the July to October-2015 Collection was done at morning and night timing. Study will provides useful information about diversity of beetles in the said area as well as provides baseline data for upcoming researchers and gives wide scope for further study in entomology and biodiversity. Further study may increase the number of species of this beetle form Southern Satpuda ranges.

Keywords: Beetles, Southern Satpuda, Coleoptera, Biodiversity.

Seasonal Crop Pests of Red Gram (Pigeon Pea) in Akola Region.

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The Pigeon pea also called as red gram (*Cajanus cajan*: family: Fabaceae) is a perennial legume. The centre of origin is the eastern part of peninsular India, including the state of Orissa where the closest wild relatives occur in tropical deciduous woodland. Today, pigeon pea is widely cultivated in all tropical and semitropical regions of both the Old and the New Worlds. The large number of pests and diseases which attack pigeon pea in India (and elsewhere) is perhaps the main constraint to increased production.

Pigeon pea was found to be associated with termites (*O. badius*), crickets (*G. lucens*), and variegated grasshoppers (*Z. variegatus*) at the seedling stages, but the insects were considered minor pests. Field insect pest infestation on pigeon pea was more critical at the reproductive stage where damage was mainly caused by pod-sucking bugs (*Clavigralla* spp.), pod borers (*Helicoverpa*), pod flies (*Melanogromyza* spp.), and blister beetles (*Mylabris* spp.). The infestation and damage by Gram Pod borer (*Helicoverpa*) in this study area recorded as approximately 40% crop damage, followed by 30% damage by Spotted pod borers, about 20% by Pod Fly and less damage about 10% by Blister Beetles.

Keywords: Pigeon pea, *Cajanus cajan*, Pests.

Distribution and Diversity of Spiders in Different Microhabitats of an Educational Complex in an Urban Area of Gujarat

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Spiders are the most ubiquitous arthropod predators in terrestrial ecosystems. They are known to provide biological control of insect pests without damaging the ecosystem. However, the diversity of spiders in various parts of India is poorly studied. Apart from a few studies carried out in specific locations of Gujarat, the information on spider diversity in Gujarat is lacking. In this study, we have assessed the distribution and diversity of spiders in various micro-habitats present in the campus of M.N. College, Visnagar, and Gujarat. The campus was divided into four main microhabitats viz. garden, woody patch,



building, and abandoned building. The spiders were collected by the hand-picking method and placed in 70% ethyl-alcohol. The collected spiders were examined under a stereomicroscope in the laboratory, and identification was carried out with the help of available taxonomic keys and experts. A total of 64 species belonging to 49 genera and 17 families were recorded during the survey of two years (2019-2021). The study reveals that 78.12% species of spiders were found to be unique to a single microhabitat, 18.75% are common in at least two habitats, and only one species *Argiope anasuja*, was found to be present in all the four microhabitats of the campus. The highest diversity of spiders was found in a woody patch that holds rich floral and faunal diversity. The fragmentation and change in habitat quality caused by the construction of new buildings, roads, and parking areas may have a direct impact on the diversity of spiders in the study area. Maintaining the green cover and improve vegetation through plantation of native plants can be a comprehensive approach to sustain the diversity of least appreciated fauna like spiders.

Keywords: Spider Diversity, Gujarat, Fragmentation.

Assessment of Sloth Bear Habitat Fragmentation in Central Gujarat, with Respect to Change in Land Use and Land Cover

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The growing human population, improper land use planning, and the loss of natural habitat are all key issues that negatively affect the coexistence of humans and wildlife. Central Gujarat consists of three major districts viz. Dahod, Panchmahal and Chhota Udepur, contacting the Vindhyachal mountain range with mixed dry deciduous forest where two wildlife sanctuaries viz. Ratanmahal and Jambughoda wildlife sanctuary harbors a rich biological diversity and some threatened large mammals. The area connecting these two sanctuaries is facing several issues such as overgrazing, deforestation and encroachment. Land Use Land Cover (LULC) change assessment can be employed to investigate how the response of the ecosystem is inferred over the change during a long period of time. LANDSAT satellite images from 1990 to 2022 were interpreted to assess the change in LULC pattern leading to the habitat fragmentation. Maximum Likelihood Algorithm (MLA) of supervised classification of the satellite images overlaid on the field observation data and the accuracy assessments were performed to evaluate the change over a period of 30 years. Spectral Normalized Difference Vegetation Index (NDVI) and post classification change detection methods are used to determine the forest cover changes. Habitat fragmentation was studied using ArcGIS 10.8. Our findings reveal a significant decrease in dense forest, whereas, the other habitats occupied by the sloth bear were altered by other land use classes such as Barren land and Agriculture. The study also shows that a patch of more than 800 Sq. km is facing some major issues that need to be addressed so that the area can be established as an ecological corridor for sloth bears.

Keywords: Sloth Bear, Habitat Fragmentation, Land Use, Land Cover.



Effect of Extract of *Madhuca Indica* on Biochemical Biomarker son Fresh Water Fish *Channa Orientalis*.

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Many plant species are used to catch fish by giving them plant extract, and if the extract is poisonous to fish, it is known as a piscicide. *Madhuca indica* is a piscicidal plant, and the extract of the dry flower of this plant is toxic to fishes after exposure to the extract. The use of persistent organochlorines like DDT and of the acute toxic organophosphates has led to hazardous effects on environment and human beings. Therefore, attention was directed towards the development of alternative chemicals. Now-a-days, botanical compounds are being used as an alternative to synthetic pesticides. Biochemical estimation was carried out by using standard methods. Alanine aminotransferase (ALT) levels were determined by the colorimetric method of Reitman and Frankel (1957), alkaline phosphatase (ALP) and acid phosphatase (ACP) levels were determined using the method of Bessey et al. (1946). Total protein (TP) was estimated by the biuret reaction (Lowry et al., 1951). and blood glucose by the glucose oxidase method of Marks and Dawson (1965); The data was statistically analysed by using SPSS version 16.0 subjected to paired sampled t-test analysis. A significance level of $p \leq 0.05$ was used. The level of total protein was reduced with exposure of Extract. There was a concentration-dependent increase in the ALT and AST activities in the liver with significant changes in some of the treated groups relative to their respective controls. Similar trends were recorded for ACP and ALP, however, with significant ($p < 0.05$) increases recorded above the control values.

Keywords: Extract, Piscicidal Plant, Toxic, Significant.

Physico-chemical Properties of Multi-floral Honey of *Apis dorsata* from Melghat Region, Maharashtra.

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In this study, the honey samples were analyzed for their physicochemical properties. The samples were collected from different combs of *Apis dorsata* from different locations in Melghat. A number of Physical factors such as viscosity, color, electrical conductivity, and specific gravity, and chemical factors such as PH, sugar content, protein content, moisture content, free acidity, ash content, HMF, and minerals were analyzed and detected. The data were compared to published data and specifications are given in the Bureau of Indian Standards (BIS) manual. The data confirmed that the physicochemical properties of honey samples are similar to the value given by the Bureau of Indian Standards (BIS). The data obtained from the analysis of honey indicate that some physicochemical values may vary due to different locations of comb, floral source, water availability environmental conditions, or weather and they also change with time.

Keywords: Honey, Physico-Chemical Properties, *Apis dorsata*, Melghat,



Ecology and Behaviour of *Antheraea mylitta* (Drury,1773) from Vidarbha Region of Maharashtra, India

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The present paper deals with Ecology and behaviour of *Antheraea mylitta* (DRURY,1773) from Vidarbha region of Maharashtra, India. It is commonly known as Indian Tasar Silk moth, is a species of saturniid moth. Male with Antenna, head, thorax, and abdomen. Mandibles and labial palpi rudimentary. Terminal parts of maxillae are modified into vestigial proboscises. On fore wings postmedian line is prominent and red with white line on its border. The antemedian line is black or dark brown and is bordered on the inside with white line. In addition, there is a black or dark brown oblique line with a white inner border. The ocellus with hyaline area is prominently positioned at the centre of the wing. On hind wing, the black antemedian line is devoid of white inner border. The area between ocellus and the postmedian line by a wavy margin. Oblique line is absent. Wing scales are usually conical or narrow and bristle line with up to seven spines of different lengths.

Keywords: Ecology, Behavior, *Antheraea mylitta*, Tasar Silk Moth.

Assessment of Amphibian Road kills in Melghat and Purna River Basin Landscape Amravati, Maharashtra.

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Amphibians are widely considered to be useful as indicator species. Information of anuran species richness and diversity is becoming increasingly important in the context of global amphibian decline. Amphibian road mortality studies have been conducted almost exclusively in undeveloped countries. In India few studies were carried out regarding Road kills of Amphibian Fauna. Hence the attempt has been made to study the mortality of amphibian fauna on roads passing through different habitat in the Melghat and Purna river basin of Amravati region. The study was conducted from June 2017 to October 2019. We have selected roads passing through Pohra Malkhed reserve forest, Melghat Tiger Reserve Forest, Agriculture areas and semi urban area of Purna river basin of Amravati district, for the study of amphibian road kills. Survey was conducted during night time 19.00 to 22.00, used road transect method, for this we used bike for long distance travel at a speed of 15 to 20 kilometer per hour and walking method to search the road killed amphibians. A total 517 amphibian car cases of 13 species belonging to 4 families were recorded during entire study period. Unidentified *Fejervarya* species 33.65%, *Microhyla ornata* 18.56%, *Sphaerothecobreviceps* 13.53%, *Duttaphrynus melanostictus* 12.76%,



Duttaphrynusstomaticus 8.31%, *Fejervaryalimnocharis* 3.48%, *Hoplobatrachus tigrinus* 3.09%, *Euphlyctiscyanophlyctis* 2.12%, *Duttaphrynusscaber* 1.16%, *Fejerveryakerelensis* 0.96%, *Polypdatesmaculatus* 0.96%, *Kaloulataprobanica* 0.773%, and *Sphaerothecarolandae* 0.58% carcasses were recorded. In this study we found the *Fejerverya* species shown highest mortality and *Sphaerotheca* species shown the lowest mortality due to road vehicle collision. The present study revealed that the road vehicle collision became a major threat to the population of Amphibian species & their diversity in the study area.

Keywords: Amphibian Road kills, Amravati Region, Melghat Maharashtra, India.

Orbiculariae from Satpuda Landscape, Maharashtra, India.

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Satpuda Landscape with a contiguous forest cover of around 10,000 sq. km, was surveyed from 2013-2015 for spiders especially from orb-weavers. This area represents 7 families out of the 11 orb-web building families recorded from India till date. This is about 64% of the total orb-weaver families reported from India.

By using different sampling methods, 50 species from the 7 families were collected and highest number of genera were collected from family Theridiidae, showing 13 genera and 18 species; followed by highest species from Araneidae, including 11 genera and 20 species; then family Tetragnathidae, showing 3 genera and 3 species followed by family Linyphiidae having 3 genera and 3 species; then family Uloboridae including 2 genera and 3 species; family Nephilidae, 1 genera and 1 species and finally family Deinopidae including 1 genera and 2 species respectively.

Out of these 50 species, there are new records including 4 new species 1 species from Araneidae; 2 species from Theridiidae; and 1 species from Uloboridae.

Similarly 5 new generic records from Linyphiidae and Theridiidae as well as 12 new species records were reported from India including 2 species from Linyphiidae and 10 species from Theridiidae. In addition to that male *Polys* species (*P. columnaris* & *P. illepidus*) is also recorded for the first time from India.

Keywords: Orbiculariae, Satpuda Landscape; Orb-Weaver, Araneidae.



Review on Some Keystone Species Conservation Projects in India

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A species that supports the existence of several other species is known as a keystone species. It helps keep communities and ecosystems intact. With 2.4% of the world's geographical area and 7-8% of all species, India is one of the megadiverse nations. One of the 21st century's greatest conservation challenges is the loss of biodiversity. The ministry in responsibility of implementing India's forestry and environmental programmes, including running national parks and safeguarding the country's flora and wildlife. Major programmes include Project Tiger, Project Elephant, Project Rhinoceros, Project Crocodile, Project Snow Leopard, Project Vulture, and Project Cheetah conducted in India for the protection of keystone species.

We attempt to comprehend the present state of national wildlife protection efforts and their conservation in this assessment. Overall, our research indicates that India's recent emphasis on significant conservation initiatives has been a step in the right direction towards safeguarding biodiversity and Keystone species. It serves as a reminder that we must reevaluate how we interact with environment and deal with the biggest dangers to our biodiversity. The accomplishment of a few of its initiatives and programmes including Indian rhinos, tigers, and poachers has given it tremendous confidence to continue promoting a flourishing and intact wildlife.

Keywords: Keystone, Conservation, Biodiversity, India.

Diversity and Biocontrol Potential of Chosen Spiders

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A regular survey has been made in Satpura Forest Range, Salbardi, Coordinates: 21°25'23"N 78°0'55"E,. The collection represented 39 species belonging to 29 genera and 16 families. The Predatory spiders and prey relationship was investigated in forest ecosystem. Spiders were found feeding upon different insects in the field. Non- web builder spiders were more predatory than web- building ones. It was also found that spiders preferred soft bodied insects than the hard cuticular insects. *Cyrtophora citricola* was found abundantly. This species is a voracious feeder of insect pests. It was reared in the laboratory on two different insect species i.e., *Drosophila melanogaster* and *Corcyra cephalonica* larvae and the feeding potential was recorded. An adult *C. citricola* consumed on an average 13.2 *C. cephalonica* larvae and 22.4 *D. Melanogaster* in 24 hours.

Keywords: Spiders, Biocontrol Agent, *Cyrtophora Citricola*, *Drosophila Melanogaster*, *Corcyra Cephalonica*, Predatory Potential.



Fish Behaviour and Appearance an Important Parameter for Early Detection of EUS Disease

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Fish disease is a substantial cause of monetary loss to aqua culturists. In nature we are less aware of fish disease problems. Biological infectious agent is the primary cause of EUS. Epizootic Ulcerative Syndrome (EUS) causes severe ulceration and heavy mortalities of fish in the wild and culture ponds. Daily observation of fish behavior and feeding activity helps early detection of problems. In the present study fish behavior and appearance of the control, naturally affected and artificially infected fishes after 7, 14 and 21 days of Challenge infection was observed. Naturally affected fishes, exhibited sluggish movement, abnormal feeding, occasionally visiting to surface of water for oxygen along with red ring at several places on the body. Artificially EUS infected fishes after 7 days, also showed sluggish movement, abnormal feeding, occasionally coming to surface of water for oxygen, normally stretched fins and red spots on body. After 14 days they mostly remained at the bottom and seen coming to the surface after a long time, slow beating of the operculum, ate less food, showed vertical–diagonal movements and red spot with circular ring and collapsed fins. After 21 days they were found resting at the bottom in the corner of the aquaria, stopped feeding, the skin was found to be necrosed and showed some mycelia; scales were lost from the ulcerated area of the body, as compared to the normal behavior of control fishes.

Keywords: Behavior, Disease, EUS, Fishes.

Diversity of Dragonflies and Damselflies at Kondeshwar Lake and Chhatri Lake Region, Amravati, Maharashtra (India)

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The present paper reveals the species of dragonflies and damselflies. Odonates are used as bio indicators. They are often used as an indicator, whether water is clean or polluted. They serve an important role in the aquatic ecological food chain by consuming aquatic larvae; birds and various amphibians consume them as food.

Dragonflies and Damselflies are collectively called odonates. About 6,000 extant species are distributed all over the world. India has more than 500 known species. In Maharashtra state 134 species are found (reviewed in Tiple, Koparde 2015). Damselflies are found mainly near shallow, freshwater habitats. Dragonflies and Damselflies can eat hundreds of mosquito larvae in a day. These chatGpt insectivorous insects also act as bio- control agents against mosquitoes. (Andrew et.al. 2008).

Damselflies are harmless to humans. They are beautiful, beneficial predators because they help in controlling populations of harmful insects. The objective is to determine the abundance and distribution of Odonates in Amravati region of Maharashtra State. A field survey carried out during November and December, 2022. In the survey 5 species of dragonflies and 3 species of damselflies are found in the region



of Kondeshwar Lake and Chhatri Lake. The field survey shows some identified species of dragonflies like Long skimmer, hawker, Common blue skimmer. Some identified species of damselflies are Golden Darlet and Blue Grass Darlet. There is a need for the conservation of species of dragonflies and damselflies. They are used as live pest control because they are carnivorous and agile hunters. Damselflies can be conserved by avoiding indiscriminate use of pesticides.

Keywords: Dragonfly, Damselfly, Bio Indicators, Predators, Diverse, Conservation, Distribution, Agile.

The Impact of Dietary Garlic (*Allium Sativum*) on Growth Efficiency and Immune Response of catfish *Clarias Batrachus* (Linnaeus, 1758)

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An initial study was made to examine the percentage of garlic extract on growth, survival, and blood profile of fish *Clarias Batrachus*. Garlic is a type of medicinal plant which known to act as an immunostimulant. This fish had been fed on control and experimental diet up to 21 days in 4 different group. Fish reared using aquarium with a size of 60 x 50 x 40 cm, using an aeration system with a stocking density of 10 fish/aquarium. The formulated diet using garlic of fish were as followed: A. 0% without garlic in the feed (control); B. 10g/kg garlic in feed; C. 20g/kg garlic in feed, and D. 50g/kg garlic in the feed. The collected samples were analyzed for blood profile by using automated analyzers. The results showed that the addition of garlic extract to the feed had a significant effect on absolute growth and daily growth rate ($p > 0.05$), where the addition of 20g/kg showed the highest value in weight gain (18.15 ± 0.48 g) and daily growth rate (0.43 ± 0.01 g/day), erythrocytes (1.79×10^8 cells/mm³), and hemoglobin (6.54 g%) resulted in the highest growth so garlic should be incorporated in fish diet. This study can be concluded that adding garlic extract to feed at a dose of 10g/kg of feed. garlic should be incorporated in fish diet.

Keywords: Biochemical, *Clarias Batrachus*, Formulated Diet, Garlic.

Uses of Crispr/ CAS 9 in the Treatment of Human Genetic disorders.

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As the days are passing by technologies are becoming more and more advanced in each and every field of our life, our assumptions are now transforming into realities. One such technique in the field of biology is the genome editing technique ie CRISPR/CAS9. In previous times it was thought that there is no cure for genetic disorders, but right now in the modern era we have approached the DNA inside our body so there is a possibility to cure genetic disorders. CRISPR/CAS9 (Clustered regularly interspaced short palindromic repeats) is a most promising and innovative gene editing technology that offers scientists a



most efficient chance to edit the DNA and to change the gene function for desirable phenotypic variations to correct the associated genetic disorders. This technology has a broad range of applications including the editing of inherited deficiencies and treating and reducing the spread of disorders. CRISPR is a family of DNA sequences found in the genome of prokaryotic Organisms such as bacteria and archaea these sequences is derived from the DNA fragments of bacteriophages that had previously infected the prokaryotes. They use these sequences to detect and destroy the DNA from similar bacteriophages during subsequent infection; these sequences play a key role in providing a kind of acquired immunity to bacteria. Cas9 (CRISPR-associated protein 9) is an enzyme that uses CRISPR sequences as a guide to recognize and cleave the specific segment of DNA complementary to CRISPR sequences. Cas9 enzyme together with CRISPR sequences forms a basis of technology known as CRISPR/ CAS9 it can facilitate no homologous end joining, homology-directed repair, and single base exchanges.

Keywords: CRISPR, CAS9, DNA, Genetic Disorders.

Nanotechnology an Emerging Approach to Environmental Pollution Control

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According to the US Environmental Protection Agency (EPA), pollution is any substance present in water, soil, or air that diminishes the environment's natural quality, offends the senses, poses a risk to human health, or reduces the usefulness of natural resources. One of the most serious issues today facing humans and other life forms on our planet is environmental pollution. According to the definition of environmental pollution, it is "the contamination of the earth and atmosphere system's physical and biological components to the point where normal environmental processes are adversely impacted". Urbanization and industrialization, agricultural practices, mining, the burning of fossil fuels, plastic, and particulate matter are the main causes of environmental pollution. The by-products of modern agriculture can have unintended effects on ecosystems and human health, from pesticides to fertilisers runoff, from greenhouse gas emissions to dangerous particulates. The biggest environmental challenge today is pollution, which has risen in importance with growing urbanization and population growth. Nanotechnology seems to be an emerging solution to these issues. It is being investigated whether nanotechnology can offer new ways to clean the environment and enhance the efficiency of existing technologies. By limiting the release of pollutants or halting their formation, this technology is also being investigated for use in pollution control.

Keywords: Nanotechnology, Environmental Pollution Control, Human Health.



Osteology of *Sperata seenghala* (Sykes, 1839), a Giant Freshwater Catfish (Teleostei: Bagridae) of Indian Sub-Continent Region.

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The present study was carried out on *Sperata seenghala*, a giant freshwater catfish which is widely distributed in Indian sub-continent regions. *Sperata seenghala* belongs to family bagridae has great commercial importance, market value as food due to its good taste and rich nutritional value. Osteology is the skeletal study for understanding remarkable and adaptive variations in bone structure. It is the important taxonomical tool for classification of fishes. The present study deals with study of morphometric and detailed osteological characters of catfish *Sperata seenghala*. Morphometric character is supported by osteology play significant important in fish systematics. The observed skeletal structure was vertebral column followed by caudal fin, pelvic fin, pectoral fin, dorsal and anal fin. Gill arch showed the set of conical teeth and dentary at lower jaw. The osteological description of *Sperata seenghala* is helpful for further taxonomical studies and phylogeny of whole bagridae family.

Keywords: Catfish, Morphometric, Osteology, Skeletal, Systematics.

Seasonal Variation in the Diet of Sloth Bear in Non-Protected Area of Central Gujarat, India

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Feeding ecology of sloth bears is studied in Chhota Udepur and Dahod districts in Central Gujarat, India from January 2021 to May 2022. The study area is known as one of the potential corridors connecting Ratanmahal wildlife sanctuary and Jambughoda wildlife sanctuary and harbours a population of more than 100 sloth bears. The area is mostly patchy and fragmented, interspersed with agriculture land and settlements with high anthropogenic pressure. The study area is divided in grids (2 km²) and the sloth bear scats were collected through sign survey. During the study period, 63.4% scats, 17.68% digging marks, 15.25% pugmarks, and 3.65% claw marks are recorded as sloth bear signs. We collected 189 scats, of which 23.28% were found in the winter, 56.61% and 20.10% were collected in summer and monsoon, respectively. Sloth bears being a myrmecophagous; 77.26% of termites and ants are found in the scat collected in winter, followed by 57% in the summer, and 28.94% in the monsoon. Moreover, 15 species of fruits seeds were identified from the scat in different seasons. During the winter, we found 81.8% animal matter and 75% plant matter. During the summer, 69.16% of plant matter and 61.68% of animal matter is found. We found 60.52% plant matter and 42.10% animal matter in monsoon, while a similar study was carried out in central India, where they found 87% animal matter during the monsoon. No vast variation in diet is observed from the study area except in monsoon mainly due to erosion of termite mound caused by rain. Fruits seem to be an important source of food for sloth bears, and factors influencing fruit availability or seasonality will have an impact on both bear foraging and human reliance on such fruits as a common source of food.

Keywords: Seasonal Variation, Sloth Bear, Gujarat, Scats.



Web Architecture of Giant Orb Weaver, *Nephila pilipes* in response to Habitat and Food

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The web of *Nephila pilipes* is usually seen among the tall trees in the forest. Female golden orb web spider, *Nephila* uses her web as semi-permanent home site. Some web architectural parameters were measured in 15 webs of subadult and adult female *Nephila* spiders in deep forest and sparse forest each. In deep and dense forest, overall web size is larger than in sparse forest. Web width and web height is comparatively more in dense forest. In sparse forest, web shows more hub displacement and less mesh width to enhance prey capture efficiency. Whereas in dense forest webs, there is less hub displacement and wide mesh width to capture larger prey. Large population of healthy *Nephila* with larger and more symmetrical webs is seen in dense forest. Giant wood spider, *Nephila* is at the top of food web of small invertebrates. This food web is the subset of food web of top carnivore like tiger. Hence, for healthy forest ecosystem, these spiders should conserve by protecting their natural habitat.

Keywords: *Nephila*, Web Architecture, Hub Displacement, Mesh Width.

Effect of *Azolla pinnata* on Freshwater Fish *Rasbora daniconius* with respect to Mineral Contents

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The present study is to understand the effect of the fern *Azolla pinnata* as a supplementary feed for the fish *Rasbora daniconius*. Dry and fresh *Azolla* was evaluated as a feed ingredient for fish. *Azolla* is a small free-floating aquatic fern native to Asia, Africa, and America. *Azolla* was reported to be rich in mineral profile, and the fern was found to be a rich source of calcium, phosphorous, potassium, ferrous, copper, magnesium, and zinc. Freshwater fish *Rasbora daniconius* were acclimatized by feeding on prawns which were substituted by 10% to 15% *Azolla* in two groups. The present study revealed that there was an increase in mineral content as compared to the control.

Keywords: *Azolla pinnata*, Mineral, *Rasbora daniconius*.

Spider Diversity of Katepurna Sanctuary District Akola (MS) India

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Present study were made on preliminary spider diversity of katepurna sanctuary. The Katepurna Sanctuary located in Akola and Washim district of Maharashtra is an exotic sanctuary dotted with an abundance of flora and fauna. The sanctuary lies in close proximity to the catchments area of Katepurna reservoir (Mahan Dam). Its area is geographically located at - 20°25'0.54"N 77°10'50.14"E. The land vegetation at



Katepurna sanctuary is southern tropical dry deciduous forest. There are over 115 species of plants at this sanctuary. During spider survey 92 species of spiders were recorded, belonging to 19 families. Most species of spiders found belonged to family Araneidae & Salticidae, Out of total spiders species recorded about 48% were found to be web builders, 52% were ground wanderers. The pattern of web building egg laying, egg sac, feeding and reproduction were noticed for different species and properly recorded. Araneidae (25 species) Salticidae (9 species) Oxipidae (7 species) Gnaphosidae (6 species) Theridiidae (6 species) Philodromidae (5 species) Thomisidae (4 species) Lycosidae (3 species) Hersillidae (2 species) and Uloboridae (4 species) were recorded from different area of Katepurna wild life Sanctuary family, generic and species diversity were observed. Katepurna Sanctuary is having good diversity of spiders, there is a need for the conservation of this creature because it is a part of the food chain in protected area.

Keywords: Spider Diversity Katepurna Sanctuary Salticidae, Araneidae, Thomisidae, Lycosidae.

Study of Ostracods Diversity of Popatkhed Dam near Akot Tahsil, District: Akola (M.S.), India

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The Popatkhed Dam is principal fresh water body located in Popatkhed village of Akot Tahsil in Akola District of Maharashtra State. Akot is a tahsil place and it is 45 km north side away from Akola and 90 km north side from Dharni (Melghat). It is about 778 m above from sea level. The Ostracods were studied from June 2021 to May 2022. During this period total 2 species of Ostracods were found in sample of water three sites A, B and C of Popatkhed Dam.

Keywords: Popatkhed Dam, Ostracods, Diversity.



Spider Fauna of Gnaphosidae (Pocock, 1898) in Patur Forest

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Spiders play an important role in the food chain and food web of Terrestrial Ecosystem. Ground spiders comprise Gnaphosidae, the seventh largest spider family are characterized by having barrel-shaped anterior spinnerets that are one spinneret diameter apart. Spider diversity was most abundant in this region and this diversity was very rich during the month of September to February. The spiders of family Gnaphosidae of Patur forest division and agriculture lands were studied from June 2022 to January 2023. From the present study we studied and observed 06 different species of spiders belonging family Gnaphosidae. Among the specimens most of the individuals were adult male and female. The genus and species are as follows-*Agroeca pratensis* Emerton, 1890 (Female), *Micaria longipes* Emerton, 1890 (Female), *Talanites echinus* Chamberlin, 1922 (Female), *Zelotes fratris* Chamberlin, 1920 (Female), *Zelotes sp.* (Female).

Keywords: Spider Diversity, Gnaphosidae, Taxonomy, Patur Forest.

Checklist of Spider Fauna of PDKV Campus, Akola

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Spiders play an important role in the food chain and food web of Terrestrial Ecosystem. Spider diversity was most abundant in this region and this diversity was very rich during the month of September to February. The spiders of Dr. Panjabrao Deshmukh Krishi Vidyapeeth were studied during June 2022 to December 2022 by using different techniques. From the present study we studied and observed 42 different species of spiders belonging to 14 families. Among the specimens most of the individuals were adult male and female. They belong to family *Araneidae* represented 15 species, *Clubionidae* 1 species, *Eresidae* represented 1, *Gnaphosidae* 3 species, *Hersilidae* 1 species, *Lycosidae* represented 3, *Eutichuridae* 1 species, *Oecobidae* 1 species, *Oxyopidae* represented 3, *Philodromidae* 1 species, *Pholcidae* 3 species, *Salticidae* represented 5, *Scytodidae* 1 species, *Tetragnathidae* 3 species, *Theridiidae* represented 5, *Thomisidae* represented 3, *Uloboridae* represented 1.

Keywords: Spider Diversity, Taxonomy, PDKV Campus Akola.



Diversity of Dragonflies (Insecta: Odonata) in Some Parts of Darwha Taluka of Yavatmal District, Maharashtra

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Diversity of adult dragonflies in some part of Darwha taluka of Yavatmal district was studied for a period of near about one year. In our study 19 species of dragonflies belonging to 2 families and 10 genera were recorded. Under order Odonata and suborder Anisoptera 18 species belonging to family Libellulidae and only 1 species belonging to Gomphidae family were recorded. Odonates can help to control small insects like mosquitoes and hence their conservation is of importance.

Keywords: Diversity, Dragonflies, Odonata, Yavatmal District.

Diversity of Birds in Upper Morna Reservoir, Medshi, Dist-Washim , Maharashtra

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Diversity of bird in specific area is depending on food requirement, breeding season and water body and many more factors. Some birds live territorially and some make huge flocks or groups. The avian fauna are also attractive features of water body of Upper Morna Reservoir along with the local resident's terrestrial fauna of bird's locally available water fowls are accompanied by certain migratory avian fauna. The occasionally observed avian fauna incorporated were *Anas poicilorhyncha* (Spotbilled duck), (*Egretta intermedia*) Little Egret, *Ardeola grayii* (Pond heron), *Tadorna tadorna* (Ruddy Shelduck), *Ciconia episcopus* (Bishop Bird), *Phalacrocorax niger* (Little Cormorant), Cattle Egret, the Black-headed Ibis or Oriental White Ibis (*Threskiornis melanocephalus*). Zoya and Sundarabarathy (2007) were recorded some similar avian flora like Indian Cormorant (*Phalacrocorax niger*), little Egret, Pond-heron (*Ardeola grayii*), The Black-headed Ibis (*Threskiornis melanocephalus*) and many others 15 species were found by them. During study total eight species of birds were found in Upper Morna Reservoir, Medshi.

Keywords: Diversity, Morna Reservoir, Avian Fauna, Medshi.



Comparative Study of Protein Quantification of Milk of Lumpy Virus Infected Cow with Normal Cow Fauna of Amravati Region (M.S.)

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Apart from agriculture production, livestock, especially cattle, is an important source of livelihood for farmers in India. Local cattle breeds are considered to be low-yielding breeds and are therefore also used as work animal. Many Non-descript cattle breeds, such as Gaolao, Deoni, Dangi, Khillari, and Lal Kandhari, are the major local cattle breeds of Maharashtra (Baig *et al.*, 2017).

Lumpy skin disease is a nodular eruptive condition of the bovines especially the cattle caused by a lumpy skin disease virus (LSDV) characterised by fever, hyper salivation, lachrymation followed by the development of nodular lesions on the oro-pharyngeal region, udder, genitalia, rectum, hide etc. and sometimes ends in fatal outcome (Bhane, 2022).

In 2020, the livestock sector in Maharashtra was affected by the Lumpy Skin Disease (LSD) due to an ongoing epidemic originated from Zambia of Africa in 1929. An estimated 95,000 cattle in different regions of Maharashtra like Vidharbha, Marathwada, Gadchiroli and Beed districts were affected by LSD. The morbidity of the virus was 20% and the mortality rate was 1% (Calistri *et al.*, 2020).

In the present study, Jersey, Sahiwal, Vechur, Ongole, Rathi, Nagori these Non-descript cross breeds are studied for the protein content of the milk. The milk protein was estimated from the severely infected LSD cow fauna with the noninfected normal breeds for comparative studies by Biuret method (Gustaw Piotrowski, 1857). The milk proteins estimated are comparatively higher in the milk of Nagori cows (5.5 gm/100ml) and lowest in Jersey cow (4.00 gm/100ml). Due to LSD infection, mean percent value of Protein of cow milk shown highest decrease in Sahiwal milk (26.96%) and lowest decrease in milk of Rathi (4.07%) breed.

Keywords: Lumpy Skin Disease (LSD), Milk Protein, Biuret Method.

Present Status, Challenges and Scope of Ornamental Fish Business in Amravati District, Maharashtra

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The study was conducted on present status of ornamental fishes and its future prospects where thirteen (13) aquarium shops were found in Amravati, Through a well-designed research framework and questionnaire, 9 aquarium species were enlisted in the study Mostly from the Order 'Cypriniformes'(44.12%) and family 'Cyprinidae'(38.24%) were most popular among ornamental fish market. In our survey, *Cyprinus carpio* and *Carassius auratus* (Orenda) were most abundantly found to sell in aquarium shops. Poor quality of local species and insufficient local hatchery was marked as the



major constraint in ornamental fish business. Major problems of aquarium business in Amravati were sorted out through this study and some recommendations were made which may be useful for future enrichment of aquarium business in Amravati.

Keywords: Present Status, Future Prospects, Ornamental Fish, Amravati Marketing Channel.

Checklist of Ants in Various Parts of Jijamata Mahavidyalaya Campus of Buldhana Maharashtra, India

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Ants are social insects. It lives in large groups called colonies. Ants are playing significant role in nearby environment. Ants are one of the world's strongest creatures in relation to its size. Ants turn and aerate the soil, allowing water and oxygen to reach plant roots. In various ways, ants more importantly conserve the ecosystem. This study explores the present status of different fauna in various sites of Jijamata Mahavidyalaya, Buldhana college campus. Total 10 species belonging to 10 genera that spread over 5 subfamilies. Two species of ants fauna named *Crematogaster stollii*, *Camponotus sp.* (worker) were found in abundance in different parts of the campus favoring different microhabitats.

Keywords: Ants Colonies, Creature, Conserve, Ecosystem.

Effects of Invasive Species on Aquatic Fauna.

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Humans have effectively transported thousands of species around the globe and, with accelerated trade; the rate of introductions has increased over time. Aquatic ecosystems seem at particular risk from invasive species because of threats to biodiversity and human needs for water resources. Here, I review some known aspects of aquatic invasive species (AIS) and explore several new questions. We describe impacts of AIS, factors limiting their dispersal, and the role that humans play in transporting AIS. We also review the characteristics of species that should be the greatest threat for future invasions, including those that pave the way for invasions by other species ("invasional meltdown"). Susceptible aquatic communities, such as reservoirs, may serve as stepping stones for invasions of new landscapes. Some microbes disperse long distance, infect new hosts and grow in the external aquatic medium, a process that has consequences for human health. We also discuss the interaction between species invasions and other human impacts (climate change, landscape conversion), as well as the possible connection of invasions with regime shifts in lakes. Since many invaders become permanent features of the environment, we discuss how humans live with invasive species, and conclude with questions for future research.

Keywords: Invasive Species, Aquatic Fauna, Climate Change, Landscape Conversion.



Diversity of Spiders in Agro-Ecosystems from Yavatmal District (Maharashtra State)

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Spiders are among the most abundant insectivorous predators of Terrestrial ecosystem. Spiders are one of the most diverse animals group in the world. Order Araneae is a large group of animals, which is commonly called as Spiders. Spiders play an important role in insect pest control without any harm to agro-ecosystem. Recently in agricultural fields reduced pesticide use and ecological sustainability have lead to increased interest in spiders as potential biological pest control agents. Spiders act as natural biological control agent in agro-ecosystem. They are widespread and found in all types of habitats. Regularly use of pesticides in agricultural fields which decreases the spider populations.

Spider species abundance in agro-ecosystem can be high as undisturbed natural ecosystem. The Spiders varies greatly in their shape and size. Spiders act as pest control creature, which feeds on crop destructive insects. Spiders are beneficial bio-control agent of insect pest in agro-ecosystem. A survey of Spiders was carried out in Agro-ecosystems of Yavatmal District during November 2021 to November 2022. During the present study I have reported 179 species of Spiders belonging to 16 Families and 46 genera. Spiders of Families Araneidae, Clubionidae, Eresidae, Gnaphosidae, Hersilidae, Lycosidae, Miturgidae, Oxyopidae, Philodromidae, Salticidae, Scytodidae, Sparassidae, Tetragnathidae, Theridiidae, Thomisidae and Uloboridae were recorded during the investigation.

Keywords: Spiders, Diversity, Agro-Ecosystems, Yavatmal.

Preliminary Study on Gut Microflora Isolated from Fecal Material of Wild Animals using Non-Invasive Technique

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Gut microflora plays an essential role in host physiological activity as well it contributes significantly both the health and diseased states of animals. Faecal matters of an animal is one of the sources in which undigested organisms or their parts can be observed along with microflora. Micro-organisms do present and interact in host GI tract though it is important to know how they contributes to various enteric diseases in humans as well animals. GI bacteria from captive animals have been studied via cultivation-based techniques, which requires suitable temperature and enriched or selective media. However, the gut microflora from free ranging wild animals are least studies due to several reasons including availability of sample, permission and their secretive nature. The present work is a pilot study to inventories the gut microflora of wild animals using non-invasive technique. The fresh faecal samples of various wild mammals were collected and stored in a normal saline water and inoculated on enriched media in aseptic condition. The inoculum was incubated at 37⁰ temperature to allow the growth of different microbial



colonies. Further isolation was done in order to prepare the pure culture. The organism from the pure culture were studied for their morphological characteristics for preliminary identification. We found 33 different colonies from the eight fresh faecal samples of four different mammalian species in which one was carnivore and three were herbivore. A significantly increased number of colonies found on Nutrient agar from the fresh scats of wild animal. The bacterial colonies were further isolated in pure form and performed Gram staining for the identification. The changes in the morphology of these colonies are probably brought about the sources of bacterial interaction in the gut of wild animal. The further biochemical and molecular identification of these gut flora will help to understand the transformation of microorganisms within the ecosystem.

Keywords: Gut Microflora, Fecal Material, Non-Invasive Technique.

A Status of Oral Submucous Fibrosis in Amravati Region

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Oral cancer is a major health problem in some parts of the world, especially in developing countries. Worldwide, the annual incidence exceeds 30,00,000 new cases.

OSMF is a chronic, premalignant condition of the oral mucosa which was first described by Schwartz (1952). Pindborg (1966) defined OSMF as “an insidious, chronic disease affecting any part of the oral cavity and sometimes the pharynx

This disease characteristically causes mucosal rigidity of varying intensity, which results in progressive inability to open the mouth. This is an important criteria by which the severity of disease is usually measured.

Oral submucous fibrosis is diagnosed on the basis of clinical criteria including oral ulceration, paleness of the oral mucosa and burning sensation (particularly in the presence of spicy foods), hardening of the tissue and presence of characteristic fibrous bands. The present paper deals with the study of status of incidences of the disease in Amravati Region.

Keywords: OSMF, Premalignant, Insidious, Chronic, Oral Cavity, Mucosal Rigidity.



Physicochemical Investigation of Malkhed Dam Water of Amravati District, Maharashtra.

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In this present investigation, the physicochemical parameters were assessed for a period of six months, during this study the physicochemical parameters like pH, conductivity, temperature, humidity, free Co₂, total solid, total alkalinity, dissolved oxygen, and Total hardness, were found to be within the normal range and indicated better quality of dam water.

Keywords: Physiochemical Parameters, Total Alkalinity, Temperature.

Seasonal Incidence of Majorinsect Pest and Minor Insect Pest on Banana in Anjagaon Surji Region, Dist-Amravati -Maharashtra

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Origin of Banana: Musa species grow in a wide range of environments and plantains of the tropics to cold-hardy fiber and ornamental plants. These large, perennial herbs, 2-9 m in height, is evolved in Southeast Asia, New Guinea, and the Indian subcontinent, developing in modern time secondary loci of genetic diversity in Africa, Latin America, and the Pacific.

Musa species attained a position of central importance within pacific societies, the plant is a source of food, beverages, fermentable sugars, medicines, flavourings, cooked foods, silage, fragrance, rope, cordage, garlands, shelter, clothing, smoking material and numerous ceremonial and religious use. Banana is a globally important fruit crop with 97.5 million tons of production. In India, it supports livelihood of millions of people. Banana occupies 20% area among the total area under crop in India and contributes 37% of the total fruit production and ranks second in importance next to mango with a total annual production of 16.91 million tons from 490.70 thousand hectares with national average of 33.5 T/ha. Bananas were originally found in South East Asia, mainly in India.

Banana, the fruit of a plant of the genus -Musa (family- Musaceae) is basically cultivated for food, and secondary for the production of fibers, and also for producing tissue-thin tea bags. Besides this, bananas are also cultivated for some ornamental purposes in various regions of the world. They are also known as Bananier Nain, Canbur, Curro and Plantain. These creamy, rich, and sweet fruits are favourite among the people of all ages right from infants to elders. Bananas consist mainly of sugars (glucose, fructose and sucrose) and fiber. They provide instant energy as they are the rich sources of Vitamin B6.

Keywords: Aphid, Cut Worm, Banana Scab Moth, Thrips, Bunchy Top Virus.



Diversity and Seasonal Variations of Waders and Wading Birds at Malkhed Lake of Amravati Region, Maharashtra.

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Waders are one of the important indicators of richness of the wetlands. Wetlands are precious abode and support systems of varied faunal taxa. The present study was an attempt to assess and evaluate the status and distribution of waders and wading birds. This research exercise was carried out for successive one year from October 2021 to June 2022 at Malkhed Lake of Amravati Region, Maharashtra. In present investigation 31 species of waders and 24 species of wading birds belonging to 12 families i.e. Scolopacidae, *Recurvirostridae*, *Rostratulidae*, *Jacaniidae*, *Burhinidae*, *Charadriidae*, *Glareolidae*, *Anhingidae*, *Phalacrocoracidae*, *Ardeidae*, *Phoenicopteridae*, *Ciconiidae* were recorded. During the study, 24 winter visitors, 22 were summer visitors and 7 resident species of waders were noted out of which vagrant and rare species namely Grey-headed Lapwing, Ruff, Spotted Redshank, Marsh Sandpiper, Curlew Sandpiper were seen. During the survey, 24 species of wading birds were recorded. Out of which 19 were resident, 2 winter visitor, and 2 resident migrant and 1 passage visitors Greater Flamingo were seen. We have also recorded total 35 nest of 5 wader species in the month of June namely Black-winged Silt, Red-wattled Lapwing, Kentish Plover, Greater Painted-Snipe, Small Pratincole. These habitats are richly supplied with variety of food sources like invertebrates, fishes and frogs. Thus, it can be concluded that selected wetlands is richly diversified, with patches of grassland and freshwater wetland and provide feeding and roosting grounds for resident and migratory waders as well as wading birds. Wetlands around Amravati region are supporting services for bird fauna in order to maintain biological and genetic diversity. Commercial exploitation of fishes, seasonal agricultural practices on the open mudflat, increasing anthropogenic activities was recorded as the major threats to this precious wetland.

Keywords: Waders, Wading birds, Diversity, Wetland, Amravati, Maharashtra.

Diversity and Study of Ants in Vegetable Farms in Amravati (M.S., India)

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The study examined the diversity of ants in the vegetable farms in Amravati city, (Maharashtra), as there is no adequate information pertaining on ant diversity of this region. Ants are good indicators of disturbance, because they show quick response to environmental changes. Ants were collected from two different habitats with varying disturbance levels with the help of pitfall traps and hand collection methods. The present study was carried out during December 2017 to February 2018. The sampled specimens representing 08 species belonged to 06 genera and three subfamilies. The most diverse subfamily was Myrmicinae (4 genera with 6 species), followed by Dolichoderinae (1 genera with 1 species) and Pseudomyrmecinae (1 genera with 1 species). This study emphasizes the dominance exhibited by the subfamily Myrmicinae within the ant communities, due to their ability to adapt to different niches.

Keywords: Diversity, Ants, Study Area, Distributions, Amravati, Species Richness.



Genetic Diversity Studies of Kashmir Favorolla across its Distribution Range in Jammu and Kashmir

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Genetic diversity of Kashmir Favorolla in six districts of the Jammu and Kashmir state was explored to make conservation plans. A total of 250 samples were collected and genotype of 15 polymorphic micro satellite loci. Altogether 221 alleles were found with the mean 4.23 ± 2.72 and effective no of allelic 3.45 ± 1.23 . Loci MWM-5 yielded highest allelicno. ($N_a=68$) while as Loci HUI-8 yielded the lowest no. ($N_a=10$) in the population. Out of 15 microsatellite loci used, 14 loci showed PIC value higher than 0.5 and considered informative for population genetics studies. The average expected and observed heterozygosity are 0.67 and 0.56 respectively, which is quite high and does not point towards a loss of variability, due to various forces acting on the population and creating a population structure. Hardy Weinberg equation estimation were conducted and all 15 loci does not obeys 95% level of confidence. The quantitate and qualitative tests were also employed to asses recent genetic bottleneck. The normal L-shaped curve revealed that population has not experienced any genetic bottleneck in the last few generations.

Keywords: Kashmir Favorolla, Genetic Diversity, Micro Satellite, Genetic Bottleneck.

Preliminary Study Dipteran Flies of Buldana District in Maharashtra.

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Diptera are major contributors to the maintenance of plant diversity through their participation in pollination systems and networks. Diptera are rich in species with specific microhabitat or breeding-site requirements, conferring a high potential for habitat-quality assessment and conservation planning. As expected for a ubiquitous group with diverse habits and habitats, the Diptera are of considerable economic importance. Pestiferous groups can have significant effects on agriculture, animal and human health, and forestry. A comprehensive survey was made during 1st July 2020 to 30th June 2021 to study biodiversity of Dipteran flies in Buldana district. About 3 families, 12 Genera, 24 Species, of Dipteran flies were found during the survey. A camera trap method was employed for the study purpose.

Keywords: Diptera, Human Health, Dipteran Diseases, Diversity.



Avifaunal diversity in and around Zola (Wai) Dam, Tahasil Babhulgaon of Yavatmal district

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Zola (Dam) is a small waterbody located in BabhulgaonTahasil of Yavatmal District and is situated on coordination of N 20.46300, E 78.16720. Waterbody is surrounded by the hilly region. Like other small waterbodies in Yavatmal district, it also having a good vegetation and food availability for avifauna. In winter various migratory birds visited to the dam. Some uncommon and rare avian species are recorded from the dam. The survey of birds is conducted from September 2020 to January 2023 by point count method.

In survey total 145 species are recorded out of that, family Phasianidae (2), Anatidae (7), Picidae (1), Upupidae(1), Coraciidae(1), Cuculidae(3), Psittaculidae(3), Strigidae (4), Apodidae (2), Caprimulgidae (2), Columbidae (4), Rallidae (4), Scolopacidae (9), Rostratulidae (1), Recurvirostridae (1), Charadriidae (4), Laridae (2), Accipitridae (12), Podicipedidae (1), Anhingidae (1), Phalacrocoracidae (3), Ardeidae (7), Threskiornithidae (4), Ciconiidae (4), Laniidae (3), Corvidae (2), Artamidae (1), Oriolidae (1), Campephagidae (1), Rhipiduridae (1), Dicruridae (2), Monarchidae (1), Aegithinidae (1), Muscicapidae (6), Sturnidae (4), Muscicapidae (7), Sturnidae (4), Paridae (1), Hirundinidae (2), Pycnonotidae (2), Cisticolidae (4), Zosteropidae (1), Sylviidae (3), Alaudidae (3), Nectariniidae (2), Passeridae (2), Motacillidae (4), Estrildidae (4).

Keywords: Avifaunal, Diversity, Species, Family



Induced chemical and physical mutagenic studies in M1 generation of Chickpea (*Cicer arietinum* L.)

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The seeds of chickpea (*Cicer arietinum* L.) varieties -Vishal and Jaki were treated with mutagens EMS, SA and rays. M₁ generation was raised and studied with respect to different morphological parameters such as germination percentage, plant survival percentage at maturity, plant sterility percentage and fertility percentage.

Germination Percentage was found lesser in both populations treated with chemical mutagens as compare to physical mutagen gamma radiation and control. High sterility is recorded in M₁ plants of both Chickpea varieties treated with EMS. However, the plant survival and fertility percentage were highest in gamma ray treated M₁ population of both varieties. An increasing trend with an increase in mutagenic concentrations/doses is recorded for percentage of sterility while for germination percentage and plant survival percentage at maturity revealed decreasing trend with increasing mutagenic concentrations/doses.

Keywords: Chickpea, Morphological parameters, Chemical mutagens, M₁ generation.

Digitization of Bark Morphology for the Identification of Tree Species in GVISH Campus, Amravati, (M.S)

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Present study based on digitized database of bark morphology which is used as a tool for taxonomical identification and may help in the study on diversity of trees. Most of the trees shows many similarities in bark, it may confuse for identification, but if study the bark carefully in every season and in different life stage of trees, definitely a site is developed for the identification on the basis of characteristics like color, texture and specific pattern, so it is small attempt to prepare digitized database of bark for identification of common tree species in Institute Campus.

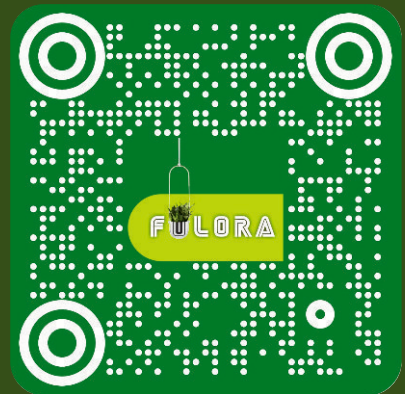
Keywords: Bark, Digitization, GVISH, Tree Species.



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Green and Chemical Synthesis of TiO₂ Nanoparticle and Evaluation of their Anti-Microbial Activity against Various Microorganisms.

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Nanotechnology is the creation and manipulation of matter on atomic, molecular and super-molecular scale, it is considered to have great potential for the development of new innovation materials for the welfare of human as well as environment. Nanoparticles can be formed by various materials such as metals, metal oxides, nonmetals or semiconductors. Metal nanoparticles show the potent antimicrobial effect which proved it as good alternative for classic antimicrobials. Metal NPs are known for their interaction with cellular components such as DNA, RNA and ribosomes and altering its metabolism, hence effectively kills microbes. Metal nanoparticles are highly exploited for their promising applications in medical field. TiO₂ nanoparticles can be produced by chemical, physical or biological method and holds great antimicrobial potential. Plants are the better biological system for nanoparticles synthesis as they are toxic chemical free and provide natural capping agents. Using plant extracts are more cost effective than microbial system as it reduces the cost of culturing them. Synthesis of TiO₂ nanoparticles was done by using sol-gel method and green synthesis using biological method with leaf extract of *Nyctanthes arbor-tristis* and characterization was done by XRD and UV-Vis spectrophotometer and *In vitro* analysis of efficacy of nanoparticles was also done.

Keywords: Nanotechnology, TiO₂ Nanoparticles, Green Synthesis, Antimicrobial Activity.

Chemotaxonomy: A Tool to trace the evolutionary history of plants

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Nature shows many variabilities of living components of the environment which possesses many useful as well as harmful and inactive chemical constituents. The classification which is based on these chemical constituents is known as chemotaxonomy. All the plants produce secondary metabolites that are derived from primary metabolites. The chemical structure of the secondary metabolites is often specific and restricted to taxonomically related organisms. The classification of plants on the basis of these specific class of secondary metabolites and their biosynthetic pathways constitutes chemotaxonomy study. Therefore, chemotaxonomy study used directly to generate a Phylogeny tree or cladistics or a cladogram. Its study is helpful to taxonomist, Phyto-chemists and pharmacologists to solve selected taxonomical problems and for the elucidation of phylogenetic relationships.

Keywords: Chemotaxonomy, Cladogram, Primary Metabolites, Phylogeny, Secondary Metabolites.



New Pentostatin analog design for hairy cell Leukemia using computational Drug Designing approach

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Leukemia is a cancer of white blood cells. It is characterized by an abnormal accumulation of WBC in the bone marrow which leads to bone marrow failure and is manifested in form of anemia and thrombocytopenia. This arises from neoplastic transformation usually of a single cell. There are four common types of leukemia: 1) Acute lymphoblastic leukemia (ALL); 2) Acute myeloblastic leukemia (AML); 3) Chronic lymphocytic leukemia (CLL); and Chronic myeloid/myelocytic leukemia (CML). Drug Designing, one of the hottest topics have found its new pathway to create a history in the field of medical science. The lead compound analysis starts with CADD, assisting to identify and optimize the right compound. In the following study, molecular modelling method has been used for modelling a new molecule for leukemia using new pentostatin a drug that is already designed. Its R group is modified by replacing different functional groups like R1-H, R1-F, R1-CL, R1-OH, R1-NH₂, and R1-CH₃ and docked with specific protein with help of software. The molecules designed as such are optimized using different algorithms. Their affinity and binding free energy checked with protein. The molecule with lowest binding free energy changes will have the maximum binding affinity. Bonding free energy calculation including molecular docking and molecular modelling.

Keywords: Leukemia, Anemia, Thrombocytopenia, Drug Designing, New Pentostatin, Molecular Docking.

Induced chemical and physical mutagenic studies in M₁ generation of Mungbean (*Vigna radiata* L. Wilczek)

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Seeds with about 10% moisture content, of two Mungbean varieties AKM - 8802 and AKM - 4 were exposed to four doses of gamma rays (100 gy, 200gy, 300gy and 400 gy) and with four concentrations of ethyl methanesulphonate (0.1%, 0.2%, 0.3% and 0.4%). M₁ population was raised with 100 treated seeds of each cultivar per dose of mutagen and studied with respect to different morphological parameters such as germination percentage, plant survival percentage at maturity, plant sterility percentage and fertility percentage. A wide range of germination rate, Survival rate, Fertility rate and Sterility rates are observed in the M₁ population. In AKM - 8802, the germination rate and survival rate was greater in Gamma radiation treated population than that of EMS treated and control. The fertility rate is equal in both treatments and the Sterility rate is very insignificant in both treatments and was observed in M₁ population. In AKM - 4, the germination rate, survival rate and sterility rate was greater in Gamma radiation-treated population than with EMS and controls.

Keywords: Mungbean, Morphological parameters, Chemical mutagens, M₁ generation.



Economic and Medicinal Attributes

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In recent years, increasing interest in natural and traditional plants, which are an integral part of rural life, has been observed because of health concerns and new social trends. Many years of ethno-medical research in India have increased our knowledge of different aspects of indigenous medical systems. Like any other cultural system, indigenous medical systems have been undergoing changes over the years continue to experience tremendous alterations in their ecological systems, socio-economic activities, political and cultural life. These changes have had some impact on the practice of indigenous medicine in many parts of India. Characterizing and evaluating the holistic value of innovative healthcare technologies (e.g. treatments, services) constitutes a crucial goal to maximize limited resources. However, the characteristics of innovation have not been well identified. This review aims to describe the characteristics of healthcare innovation. Compared with bio-medical services, ethno-medicine is usually characterized as more available, accessible, acceptable, and adaptable. This paper seeks to draw attention to the need to re-examine these attributes as applied to ethno-medical practices in India.

Keywords: Medicinal Plants, Ethno-Medicine, Healthcare Technologies.

Soil Trap Culture of AM Fungi associated with *Andrographis Paniculata* Nees.

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Soil is the basic reservoir of nutrients for plant. A sustainable agriculture uses less of chemical inputs like fertilizers and pesticides, which is having adverse effect on soil health, fertility and environment. Thus, use of microbial inoculants plays an important role in sustainable agriculture. With this context AM fungi are known to improve the nutritional status, growth and development of plants. India has numerous medicinal plant species and their products. These medicinal plants can be popularized and used to improve the economy of low-income countries of Asia and create livelihoods for its people.

Kalmegh (*Andrographis paniculata* Nees.) is such a wonder plant which has numerous medicinal properties. Hence, the purpose of this research was to isolate and identify Arbuscular Mycorrhizal Fungi (AMF) associated with the rhizosphere soils of *Andrographis paniculata* and mass propagate the spores by soil trap culture. The soil trap culture was prepared by forming composite soil sample of *Andrographis paniculata* rhizospheric soil. The coleus was grown in composite soil sample on soil: sand media. After 45 days the AMF spores were isolated for the further studies. These samples from rhizosphere area of *Andrographis paniculata* were wet sieved, and AMF spores were isolated and identified morphotaxonomically. In all five species of *Glomus* were observed e.g., *Glomus leptotichum*, *Glomus aggregatum*, *Glomus fasciculatum*, *Glomus maculosum*. The most dominant were of *Glomus aggregatum*. This dominant species will be mass multiplied and applied in further studies to record inoculation effect on growth parameters of Kalmegh. The authors believe that, as this technology being simple can easily be adapted. **Keywords:** Sustainable Agriculture, Medicinal Plants.



Relative Efficacy of Chemical, Bioagent and Organic Ammendments in Managing Root Rot Complex of *Piper longum*

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Root rot complex induced by Phytophthora, Fusarium, Rhizoctonia, Sclerotium and root knot nematode is major threat in *Piper longum* growing areas of Vidarbha region of Maharashtra. Experiment was carried out in field to observe the effect of chemical, bio-agent and organic amendmets against root rot complex of *P. longum*. At 15, 30, 45 and 60 DAT minimum disease incidence was recorded in treatment T4 : FYM (@ 20t/ha) + Fluopyram 400 SC drenching (@1.2 L/ha) + Neem Cake (@ 500 kg/ha) + *T. asperellum* (@1 kg/ha) + Copper oxychloride (0.30 %) + Mancozeb (0.25%) i.e. 26.30, 28.02, 30.84 and 30.10 % respectively which was at par with treatment T8 : FYM (@ 500kg/ ha) + Fluopyram 400 SC (@1.2 L/ha) + Karanj Cake (@ 500 kg/ha) + *T. asperellum* (@ 1kg/ha) + Copper oxychloride (0.30%) + Mancozeb (0.25%) i.e. 27.53, 29.04, 31.18 and 31.40% respectively after soil application / drenching. Whereas, maximum disease incidence was originate in control i.e. 32.56 %.

Keywords: *Piper longum*, Vidarbha region, Bioagent.

Association of Vesicular Arbuscular Mycorrhizea with Medicinal and Aromatic Grasses and Climbers in Kharif and Rabi Season

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The association of vesicular arbuscular mycorrhizae was recorded in grasses aromatic medicinal plants in Kharif and Rabi season. Percentage of vesicle colonization was highest in Gavgichaha (*Cymbopogon flexuosus*) followed by Tikadi (*Cymbopogon martini*), Citronella (*Cymbopogon witerianus*) and Khus (*Vetavir zizionodes*). Shatavari (*Asparagus racemosus*) vesicle colonization was 68.00% and arbuscule colonization was 32.00% in Kharif season. In Rabi season vesicles colonization 53.33% and arbuscule colonization 33.33%. Number of spores 20 per 10 g of soil in Kharif season and 15 per 10 g of soil Rabi season. The vesicle colonization was highest in Kharif season and arbuscule colonization almost similar in both seasons. The number of spore's maximum in Kharif season. Results of the present investigation proved that secondary metabolites do not affects association of vesicular arbuscular mycorrhizae with medicinal and aromatic grasses plants.

Keywords: Medicinal, Kharif, Grasses.



Seasonal Variation of Vesicular Arbuscular Mycorrhizae with Medicinal and Aromatic Plants in Kharif and Rabi Seasons

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The association of vesicular arbuscular mycorrhizae was recorded in aromatic medicinal plants. Percentage of vesicle colonization was highest in Jagali lasun (*Iphiginia stalluta*) followed by Panfuti (*Bryophyllum pinnatum*), Pan ova (*Coleus amboincus*), Pudina (*Mentha spp.*). Jagali lasun (*Iphiginia stalluta*) vesicle colonization was 90.00% and arbuscule colonization was 70.00% in Kharif season. In Rabi season vesicles colonization 86.66% and arbuscule colonization 60.00%. Number of spores 36 per 10 g of soil in Kharif season and 40 per 10 g of soil in Rabi season. The vesicle colonization was highest in Kharif season and arbuscule colonization almost similar in both seasons. The data shows the highest percentage of vesicle and arbuscule colonization in Kharif season than Rabi season and number of spores also varied with growing season of the host plant.

Keywords: Arbuscular Mycorrhizae, Medicinal Plants, Soil.

Studies on Cyanobacterial (BGA) diversity from Trimbakeshwar Tehsil of Nashik District

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Cyanobacteria (BGA) are gram negative prokaryotic photosynthetic microorganism. Globally responsible for much of the primary production and nitrogen fixing. Their diversity ranges from unicellular to multicellular, coccoid to branched filament nearly colourless to intensely pigmented. A present study was carried out to know the diversity of cyanobacteria and physicochemical analysis from Trimbakeshwar Tehsil of Nashik District Maharashtra. Trimbakeshwar it is part of western ghats region and the Western Ghats is a biodiversity hot spot. Water and soil sample were collected randomly from the paddy field. Selection of spot was carried out on the basis of diversity point of view and 4 selected location are Harsul, Anjanneri, Amboli, Dalpatpur of Trimbakeshwar Tehsil. Serial dilution method is used for isolation and purification of BGA species. Collected sample are serial diluted for examination. Identification of species was done by measuring the cell diameter with the help of ocular micrometry and Tab attached microscope. Total 10-15 cyanobacterial species were isolated and identified. Microscopic examination showed colonial, heterocystous and the remaining non-heterocystous filamentous forms. Genera wise distribution showed abundance of *Nostoc*, *Phormidium* and *Plectonema* followed by *Anabaena* and *Hapalosiphon*. *Microcystis* and *Oscillatoria* were least abundant. *Nostoc* and *Phormidium* showed highest abundance in terms of CFU/mL followed by *Anabaena* and *Plectonema*. Pigments (chlorophyll, carotenoids and phycobilins) and N assimilatory enzymes (nitrate reductase and glutamine synthetase) differed significantly amongst the identified cyanobacterial strains. The physico-chemical characteristics are very



much important for any water body. Among the physico-chemical parameters analysed for the soil sample, it was found that the pH of the soil is slightly acidic in all the study sites ranged between 5.00-6.01. Further the electrical conductivity (EC) varied from 0.32-0.39 dS/m, found to be a good range. Estimation of available micro and macronutrient of soil were measured, and it was found to be at low to moderate level. There was a significant difference in the comparison of the physicochemical parameters including pH, EC, TDS, and temperature values.

Keywords: Cyanobacteria (BGA), Microorganism , Trimbakeshwar.

The therapeutic potential of traditional food use in Vidharbha region.

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In India there is tradition of celebrating festival with variety of delicious food. Food contain bioactive ingredient that satisfy hunger and also provide macro and micronutrients to the body. The seasonal food and fruit are consumed during the festivals provide proper nourishment of the human body. The deficiency of these nutrient can cause diseases and the effect of climate can be tolerate by our body during the different change in climate can also depend on the traditional food. This paper attempts to congregate the nutritional value, phytochemical composition, traditional uses of food consumed during festival in vidharbha region.

Keywords: Therapeutic Uses, Micronutrients, Vidarbha Region.

Biodiversity of Chlorophyceae in Adan Reservoir Karanja (Lad), Maharashtra

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Monthly samples were collected from Adan Reservoir at four sampling stations during the period of investigation from December 2020 to January 2022. During the study period, 26 species of Chlorophyceae were recorded from the lake. The total Chlorophyceae count showed two peaks in a year, in October November 2021 and in January-March 2021. It was found that Chlorophyceae dominated the lake during winter 2021 and their minimum population was recorded in post summer and pre monsoon 2021. The minimum Chlorophyceae member were recorded 85 Ind/L and 82 Ind/L in the month of July 2021 at sampling station no. 2 and 3. The maximum no of Chlorophyceae as 1340 Ind/L was recorded in the month of November 2022 at sampling station no 1. The sampling station no. 4 also showed high count of Chlorophyceae as 1285 Ind/L and 1252 Ind/L in the month of October and November 2022 respectively. The seasonal fluctuations of Chlorophyceae member are discussed in the present investigations.



Keywords: Chlorophyceae Member, Seasonal , Fluctuations, Post summer and pre- monsoon.

Evaluation of Herbal Lotion Formulation containing *Psidium guajava* (Linn.) Leaf Extract

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The present study was aimed to develop and formulate the herbal lotion containing *Psidium guajava* (Linn.) leaf extract which may maintain skin's hydration levels by locking in the moisture, keeping the skin healthy, soft, and supple. In this study, 100gm of guava leaf powder was extracted with 70% ethanol. After maceration, the result of extraction was obtained thick extract and has characteristics dark brown color and specific odour. The herbal lotion was prepared without use of synthetic perfumes and paraben as preservatives, because paraben sensitize the skin, causing allergic reaction, and may even cause skin cancer. As preparing for herbal lotion, O/W criteria were used because the quantity of water is more than oil. After that, guava leaf extract was added in the lotion-base and stored it for 7 days at room temperature for checking their stability and other test. The lotion was creamish in colour with a translucent appearance and cooling sensation throughout the evaluation period. The prepared herbal lotion was subjected to evaluation of various physicochemical parameters such as pH, viscosity, spreadability, extrudability, washability, solubility, loss on drying and others. The physicochemical properties showed satisfactory results. The pH of all the formulations was near about 6.8, which lies in the normal pH range of the skin. The preparation was stable under normal storage conditions and did not produce any skin irritation.

Keywords: Herbal Lotion, *Psidium guajava* Leaves Extract, Physicochemical Parameters.

Some Phenolic compounds of *Amaranthus hybridus* L

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The present study was undertaken to find out Phenols content of leaves of *Amaranthus hybridus* L. In present Estimation of phenolics like total phenol, tannins, flavonol, quinons were done by using of uv-visible spectrophotometer. For estimation 1 gm of leaves were used. Collection of plant material were done from Melghat forest region, Dist.- Amravati, Maharashtra. *Amaranthus hybridus* is commonly called as Rajgira is used as vegetable. *Amaranthus* extracts have been used in ancient Indian, Chinese and Nepalese medicine to treat gynecological conditions, respiratory disorders, diabetes. In present study sufficient amount of phenolic compounds were found in leaves of *Amaranthus hybridus* recently many researchers having great interest in medicinal plants for their phenolic concentration because of phenolics possess antioxidant activity.

Keywords: *Amaranthus hybridus*, L. Phenolic Compound, Spectrophotometer.



Diversity and Seasonal Availability of Wild Edible Mushroom from Amravati District, Region of Maharashtra State

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The Amravati-Melghat region is recognised as one of the most biodiverse regions for a variety of wild fleshy mushrooms (Basidiomycetes). Exploring edible wild mushrooms from various region from Amravati district is the main focus of these studies research. The places chosen for the current study include the Melghat region, the campuses of Sant Gadge Baba University and Shri Shivaji Science College in Amravati, the Bamboo garden in Amravati, the Pohara-Malkhed forest, various localities in the Chandur Railway Tehsil, etc. Mushrooms are diverse heterotrophic organisms with very distinct dietary and ecological needs. The fundamental elements of systematic investigations of Macromycetes are survey, collection, identification, and preservation. From the forest and urban areas of the aforementioned places, healthy specimens were gathered. Some species have been discovered to thrive on rotting, dead timber logs, manure, and moist environments. There were numerous macrofungi to be found, including *Flammulina*, *Podaxis*, *Cyathus*, and *Termitomyces*. For population who following strictly vegetarian diets, consumption of wild edibles (nonpoisonous) Mushroom provides a significant source of vitamins, carbohydrates and micronutrients.

Keywords: Basidiomycetes, Macrofungi, *Flammulina*, *Podaxis*, *Cyathus*, *Termitomyces* micro nutrients.

Phytochemical and Antimicrobial analysis of Poroid Fungi- A Review

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Poroid (Polypore) fungi are group of tough, woody, leathery and poroid fungi but typically lack a distinct stalk. Macrofungi are known to produce large and diverse variety of secondary metabolites. It contains some organic compounds which provide definite physiological action on the human body and bioactive substances include tannins, alkaloids, carbohydrates, terpenoids, steroids and flavonoids. They are widely used in the human therapy, veterinary, agriculture, scientific research, to treat variety of diseases and countless other areas.

Praveen Nagadesi et.al. (2016) were analyzed the lignicolous fungi for bioactive compounds in extraction of *Ganoderma* and *Phellinus* based on their polarity solvents like ethanol and methanol. The bioactive compounds like Anthocyanins, tannins, terpenoids, and flavonoids shown excellent concentration in test fungi. The moderate concentration of alkaloids was found in *Phellinus noxious*. For the first time the bio active compounds like Phenols, Alkaloid and Anthocyanins were reported from *G. lucidum* *G. applanatum*. Palacios et al. (2011) tested extracts of polypore's species for anti-viral activity, antibacterial



and anti-fungal activity with promising results. Zjawiony, (2004) tested polypore fungi that have been show strong antimicrobial activity. Pooja Shah et.al. (2014) performed the preliminary phytochemical screening of *Ganoderma lucidum* and revealed that the extracts contain carbohydrates, glycosides, triterpenoids and phenolic compounds. They were selected different pathogenic organisms to determine the antibacterial activity of the extracts. The result of the antibacterial activity showed that the methanolic extract of *G. lucidum* showed the strongest antibacterial activity among the four extracts against the bacterial strains.

Keywords: Poroid Fungi, Phytochemical Analysis, Antimicrobial Activity.

Comparative Studies on Nutritional Composition of Hydroponic and Conventional Fodder

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In India, increase in livestock population has resulted into more demand of feed and fodder. So, there is need of adapting new farming system like hydroponic technology in which green fodder produced by growing seed in water without soil. The study was conducted to compare nutritional value of hydroponically and conventionally grown wheat fodder for 15 days on the basis of Dry matter, Ether extract, Crude protein and Ash content. The DM, CP, EE, and ash content in hydroponic wheat was found to be 15.35%, 12.73%, 3.2%, and 1.2% respectively whereas in conventional wheat fodder was 17.24%, 9.16%, 2.00%, and 8.31% respectively. From this study, it may conclude that hydroponic fodder was more nutritious than conventional method in terms of DM, CP, EE, and ash content. Hydroponic fodder is more suitable for India having different climatic zones and different cropping pattern. Because, it overcomes many problems like summer temperature, less availability of irrigation facility for growing fodder crop, fodder scarcity to the livestock population, etc. This technology can enable farmers to produce fodder for dairy animals in a nutrients rich solution or in a tap water within 15 day using low cost devices.

Keywords: Fodder, Hydroponic, Nutrients.

Target identification and inhibitor screening using docking studies against *Cuscuta* species

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Cuscuta spp. (dodder) also known as Akashvel or Amarvel, is a stem parasitic angiosperm belonging to the family Convolvulaceae. Parasitic plants are those plants for their nutrition they are depending on



another host plant, without contributing any beneficials' to them. Although there are several species of dodder distributed throughout India the most common species are large seeded dodder (*C.reflexa*) and field dodder (*C.chinensis*). These species have become a major economic concern in India. They have a wide host range like clover, tomatoes, chickpea, potatoes, etc. Dodder infestations reduce the crop yield and also increase harvesting costs. It is very difficult to inhibit the growth of this parasitic plant and no specific treatment is recommended.

This study is the dedicative attempt to find out chemical inhibitors for *Cuscuta spp.* using computational Proteomics and Drug Designing approach. For this work we have selected three *Cuscuta* species - *C. reflexa*, *C. chinensis* and *C. gronovii* which are mostly found in Vidarbha region. Finding out the target protein to inhibit the growth of selected *Cuscuta spp.*, we have downloaded 300 protein sequences from the Uniprot database. Downloaded protein sequences screened against 6,572 proteins from BindingDB database using BLAST tool. More than 60% similarity sequences were selected and aligned against Viridiaeplantae (taxon id 33090) plant family proteins to screened dissimilar sequences. From the dissimilar sequences Lipoxygenase (LOX) protein was identified as target. Total 3,545 known inhibitor structures were downloaded from BindingBD and docking screening performed by Autodock Vina. In the above work total 6 inhibitors were found with the lowest binding affinity energy score between -12.0 to -12.5. These inhibitors can be tested further for *in-vitro* or *in-vivo* and used as a potential inhibitor against *Cuscuta spp.*

Keywords: Protein Target, Virtual Screening, Molecular Docking, Inhibitor, *Cuscuta spp.*

Isolation and identification of soil mycoflora in different crop fields at Amravati Region.

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A total of 13 species belonging to 6 genera of fungi were isolated from agricultural fields at Amravati region during March 2017 to November 2018 in three intervals. The mycoflora were isolated by using soil dilution technique and soil plate technique on Potato Dextrose Agar medium supplemented by suitable antibiotics such as penicillin and streptomycin. Identification and characterization of the mycoflora were made with the help of authentic manuals of fungi. The most common among them *viz;* *Aspergillus flavus*, *Aspergillus fumigatus*, *Aspergillus niger*, *Aspergillus spp*, *Phoma sp.* *Penicillium sp*, *Penicillium funiculosum*, *Fusarium oxysporum*, *Fusarium solani*, *Curvularia clavata*, *Curvularia lunata*, and *Rhizopus stolanifer*, *Alternaria alternata*, *Alternaria Sp* were isolated and characterized. The seasonal variation and percentage frequency of the mycoflora were statistically analyzed.

Keywords: Mycoflora, Isolation, Crop Field, Diversity, Deuteromycotina, Zygomycotina.



HPTLC Fingerprinting of *Ruellia tuberosa* L., a Medicinal Herb

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Ruellia is a genus of flowering plants commonly known as *Ruellias* or Wild Petunias which belongs to the family Acanthaceae. It contains about 250 genera and 2500 species. Most of these are shrubs or twining vines; some are epiphytes. Some of these are used as medicinal plants. Many species of the genus have antinociceptive, antioxidant, analgesic, anti-spasmodic, antiulcer, antidiabetic and anti-inflammatory properties. The phytochemicals constituents: glycosides, alkaloids, flavonoids and terpenoids are present. The genus has been traditionally claimed to be used for the treatment of flu, asthma, fever, bronchitis, high blood pressure, eczema, and diabetes.

The present study attempts to standardisation, identification and isolation, of marker in *R. tuberosa* (Acanthaceae). HPTLC fingerprinting was carried out for various extract of leaf, stem and root of *R. tuberosa*. HPTLC fingerprint revealed many peaks with a wide range of Rf values. The present study of botanical and chemical screening will be useful for developing pharmacopeial standards for *R. tuberosa*.

Keywords: *Ruellia tuberosa*, Acanthaceae, HPTLC, Pharmacopeial.

Phytochemical profiling of crude extracts of *Boswellia serrata* Roxb.

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Boswellia serrata Roxb. is under the study for the phytochemical investigations. *Boswellia serrata* Roxb. is also known as Kundru, Salai, Shallaki or Indian frankincense. *Boswellia serrata* Roxb. is known for its antioxidant and antiarthritic activities. These activities are due to the presence of various phytochemicals. In the following study we analysed major groups of phytochemicals from the plant. Phytochemicals from different plant parts such as Leaf, Stem Bark and Fruit are extracted in five different solvent systems viz. Water, Methanol, Ethanol, Chloroform and Acetone by hot and cold extraction methods, the obtained crude extracts were subjected to phytochemical tests. The tests revealed presence of Alkaloids, Carbohydrates, Proteins, Tannins and Flavonoids.

Keywords: *Boswellia serrata*, Phytochemicals, Extraction Methods, Solvent Systems.



Antioxidant Screening of Wild Edible Plant *Chenopodium album*

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In this study investigation of qualitative characters and Antioxidant activity of wild edible plant species. Analysis of qualitative character was performed for edible parts of the wild edible species *Chenopodium album*. The plant was collected from the area in Amravati district and edible part analysed for dry matter, the qualitative nutritional and nutraceutical were performed as well as antioxidant activity performed by DPPH method. The percentage of free radical inhibition was 70.16% at 50µg/ml concentration of sample. The purpose of present study is to explore qualitative research and provide information about nutritional content in selected wild edible plant.

Keywords: Antioxidant activity, Edible Plant, *Chenopodium album*.

Use of Terrariums as a Teaching-Learning Tool in Botanical Studies.

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Terrariums are sealed glass containers used to grow humidity loving plants, imitating their natural habitat and facilitating their growth. Dr. N. B. Ward(1842) accidentally invented the terrarium when raising moth pupa in a closed container. Terrariums are extensively used for culturing humidity loving plants which otherwise can't be cultivated outdoors.

Plant materials are integral for Botanical studies. It helps Botanists to study various aspects of plants, their growth habits and habitats. Plant materials preserved in formalin solutions are widely used, mostly foraged and obtained from Ecologically sensitive areas. This threatens the endemic biodiversity.

Utilizing terrariums for Botanical and Ecological studies can aid the study of plant morphology, their growth habit, habitat and Ecology without disturbing their natural habitat, thereby preventing the extinction of vulnerable species and help conserve them.

Terrariums additionally help us to conserve vulnerable, endangered and critically endangered species.

Keywords: Botanical Studies, Endangered, Endemic, Habitat, Terrariums.



Vegetative Morphology Study for Species Identification

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MTR consists of a succession of hills and valleys, marked by abrupt changes in altitude, aspect and gradient. The forest was under great biotic pressure; it was important that management authorities should handle this issue as a priority work. The vegetation site was consisting mostly of middle and small sized trees, due to the hot dry climatic conditions, except *Tectona grandis*. The present research work was based on this survey and study it was possible to derive the specific requirement to define the species in the software form with its necessary information. List of tree species was generated with its local and scientific names and their taxonomical identification to make data ready for computation study.

Keywords: Morphology Biodiversity, Species, Identification.

Validation & Characterization of Plant based Drugs of *Trachyspermum ammi* (Ajwain Seeds)

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Drug property is the ability drug which shows potential of drug to prevent or cure a particular disease especially through preventing development of a pathogenic microorganism or by counteracting the effects of its products. Such drugs are substances that prevent microbial infection, have antioxidant effects and many more medicinal value. "Ajwain" is available in form of Ajwain Seeds *Trachyspermum ammi* which belong to different families. The ethanolic extract of Ajwain Seeds was prepared & tested for the antimicrobial and antioxidant properties. These crude drug was applied for Infrared Spectrometry and Gas Chromatography and Mass Spectrometry (GC-MS) analysis. The results confirmed the age old wisdom that Ajwain is a medicinal plant. Antibacterial activity against *Staphylococcus aureus* was observed with zone of inhibition on agar with Ajwain seed extracts. Antioxidant properties of the extract was tested using the DPPH free radical scavenging assay. The Infrared Spectrometry showed presence of alkene groups in both the extracts. The GCMS analysis confirmed presence of thymine (alkene) groups. It showed significant presence of antibacterial and antioxidant thymol and anti-inflammatory hexadecanoic acid. This work concludes that, there is need to increase traditional Indian medicinal knowledge by spreading awareness.

Keywords: Ajwain Seeds, GC-MS, Thymol, Antimicrobial property, DPPH Assay.



Soil Quality Crop Rotation and Crop Selection

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India our farmers are facing too much problems related to soil and yield of product of crop to focusing on their problems now we need to analyse a soil quality, crop rotation and selection of crops for betterment of environment.

The soil is the natural resource that can be categorised into different soil types, each with distinct characteristics that provide growing benefits and limitations and identifying that type of soil you require is a paramount to support the healthy growth of plant life.

The study was conducted using the parameters, indicators and physio-chemical methods. The methods are used for its selection of soil, sampling of soil, drying of samples, post drying care, then the testing of sample in laboratory by physio-chemical analysis (pH, electrical conductivity of soil, oxidation method, Rapid titration method). Chemical analysis alkaline permanganate method, osien's method, ammonium acetate extractable method and physical analysis by psychomotor, hydraulic conductivity of soil for density and texture of soil.

The soil analysis can provide information that is important for maximising nutrients, use efficiency and agricultural productivity. Rotation improve soil chemical health through the inclusion of leguminous nitrogen fixing crop which increase N levels and transforming the lithospheric nutrients.

Thus it concluded that using this information the properties of soil such as acidity, pH, alkalinity, cation exchange capacity, soil organic matters, nitrogen cycle basis on all these factors we select a crop and rotate it using strategies of crop with their fertility and compatibility. The future scope is that we can predict which crop should be taken for particular soil without any loss.

Keywords: Soil, farmer, crop, Physio-chemical Analysis, Chemical Analysis, Physical Analysis.

Survey of Ethnomedicinal Plants Used by the Korku Tribe in Melghat Region of Amravati District, Maharashtra.

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The Melghat nestling in the Satpuda hill ranges of Central India with vast tract of inviolate natural forest consisting of unique and representative ecosystems with rich biodiversity. Biodiversity of medicinal plants is the nature's gift to mankind. Tribal and rural community from their parents on folklore medicines acquire incredible knowledge of phytomedicine in non-coded form without any documentation. Korkus, Bhumka, Vaidus or Bhagats traditionally use plants for the treatment of different types of diseases. This study was carried out to explore ethnomedicinal plants of melghat region. There are 22 Plant species are recorded which are extensively being used as medicinal plants were collected and their traditional usage



by korku tribe and Vaidus were studied. The botanical name, family, vernacular name, Flowering periods, name of informer, area of plant occurrence, plant parts used are discussed in this study. This study will be helpful in providing information, awareness and conservation of Knowledge related to many medicinally important plants by local tribes. The future scope of this study is the conservation strategies for medicinal plants in melghat region which becomes helpful for various research fields like taxonomy, ethno-botany, phytochemical, mycorrhizal biotechnology, bioinformatics, biochemistry.

Keywords: Melghat, Medicinal Plants, Survey.

Effects of Arbuscular Mycorrhizal Fungi on the growth of *Chrysanthemum*: A Review

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Among the top three cut flowers crops in the international market chrysanthemum is ranked third next to rose and tulip. Due to its demand in north America and Europe it is popularly called as dollar earing flower. Abiotic stresses hamper plant growth and productivity climate change and agricultural malpractices like excessive use of fertilizers and pesticides have aggravated the effects of abiotic stresses on crop productivity and degraded the ecosystem . There is an urgent need for environmental friendly management techniques such as the use of arbuscular mycorrhizal fungi (AMF) for enhancing crop productivity. AMF are commonly known as bio-fertilizer. Chrysanthemum belonging to the Asteraceae family considered the second most important floriculture crop worldwide after roses. This is culturally significant flower with an annual sale of billions of branches. It is propagated in diverse colors, sizes and forms of composite Chrysanthemum flowers by collecting several (Purple), Carotenoids (Yellow), and Chlorophyll (Green).

Chrysanthemum is one of the most utilized plants in traditional medicine. The flower reduces inflammation and treats bruises, sprains, bites from snakes and centipedes, rhinitis, diphtheria, cholera, and malaria.

Keywords: AMF, *Chrysanthemum*, Traditional Medicine.

Investigation of Soil Mycoflora of Experimental Crop Field

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The fungi characteristic of a region or special environment is called mycoflora. The role of soil fungi is an extremely complex one and is fundamental to the soil ecosystem. Along with Bacteria, Fungi are important as decomposers in the soil food web. In present investigations the soil mycoflora of experimental crop field of department of Botany – Government Vidarbha Institute of Science and Humanities was studied



by using Potato Dextrose Agar and Glucose Nitrate Agar media. Soil Mycoflora showed the occurrence of 7 species of fungi. The GNA media supports for maximum isolation and growth of fungi as compared to PDA media. Total 34 colonies of fungi were isolated from GNA media. *Aspergillus niger* showed maximum occurrence. Due to high sporulation capacity, *Aspergillus* was found to be dominant along all the isolates in all of the experimental crop fields.

Keywords: Soil mycoflora, Crop field, *Aspergillus*.

SSC-MedDB: A digital resource on phytochemicals of medicinal plants from Amravati region

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Medicinal plants have been used as a source of drugs since prehistoric times. Medicinal plants are also used for several years to flavour and safeguard food, to treat health disorders and to stop diseases including epidemics. Nowadays in developing countries, assurance of the protection, quality and usefulness of medicinal plants as well as herbal products has now become a key issue. Medicinal plants are rich in sources of bioactive phytochemicals or bionutrients and getting their information at one place is very difficult. A comprehensive online database based on the phytochemistry of Indian medicinal plants will enable computational approaches towards natural product-based drug discovery. In this direction, we used DBMS, MS-ACCESS, IMPPAT to present a manually curated database named as SSC-MedDB including 55 medicinal plants belonging to 38 plant families studied from Medico Botanical Garden of Shri Shivaji Science College Amravati. Total 790 phytochemicals searched and noted through online resources for selected medicinal plants. This database also included different medicinal plant parts which were used to treat the 55 different diseases. This is one of the databases on the phytochemicals of Indian medicinal plants from the Amravati region and this resource is a culmination of our efforts to digitize the wealth of information contained within traditional Indian medicine. It provides an integrated platform to apply chemoinformatics approaches to accelerate natural product-based drug discovery. This is also expected to enable applications of system level approaches towards future education of the mechanistic link between phytochemicals of Indian medicinal plants and their therapeutic action. This resource will be very useful for pharma industries, researchers, faculties and students in their studies.

Keywords: Medicinal Plants, Database, Phytochemicals, Diseases, Amravati



Studies on Qualitative Phytochemical Analysis of *Petunia integrifolia* (Hook.) Schinz & Thell.

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Petunia integrifolia (Hook.) Schinz & Thell. is an ornamental plant with violet-purple funnel shaped flowers. It belongs to family Solanaceae. Qualitative analysis was carried out for secondary metabolites screening of the plant. Leaves of the plant were selected for the analysis. Various tests were carried out on aqueous and methanolic extracts to determine presence Alkaloids, Flavonoids, Saponins, Tannins, Phenols, Proteins, Cardiac glycosides, Terpenoids, Carbohydrates, Quinones. The results of the studies showed that Alkaloids, Saponins, Phenolics, glycosides, flavonoids, Xanthoproteins are present. The results of the study can serve as a valuable source of information and provide suitable standards for identification of the plant material in future investigations and applications.

Keywords: Ornamental Plant, Solanaceae, Qualitative Analysis.

PHYCOLOGICAL STUDY OF SOME NATURAL WATER RESEVIORS NEAR KATEPURNA WILDLIFE SANCTUARY WITH SPECIAL REFERENCE TO BARSHITAKLI

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The present investigation was carried out to identify the different algae in the Mahan region, near to Katepurna wildlife sanctuary, Barshitakli, Akola, Maharashtra, India. The investigation process was carried out in the month of February 2021 and samples were collected to study algal diversity in the area of Barshitakli. Total five Samples were collected from 5 different sites, in a pet plastic jar and preservation of sample. Microscopic study of algae were carried out in laboratory of Botany shri Shivaji College of Arts, Commerce & Science, Akola. Among the collected samples Zygnema, Rhizoctonium, Pithophora, Cladophora, Zoochorell, Spirogyra, and Cladophora were prominently reported. The Present study discuss basic information of freshwater algae presence, distribution but also helps for future environmental monitoring studies.

Keywords: Algae, Katepurna, Akola.



Evaluation of Antibacterial Activity of Endophytic Fungus *Myrothecium roridum* T. Isolated from *Solanum xanthocarpum* Schrad and Wendl.

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The primary goal of the current investigation was to isolate the endophytic fungi from *Solanum xanthocarpum* Schrad and Wendl. and assess their antibacterial efficacy against the five pathogenic bacterial strains. Different parts of *Solanum xanthocarpum* Schrad and Wendl. were used to isolate endophytic fungus. On the basis of macroscopic and microscopic traits, the endophytic fungus was morphologically identified. The antibacterial activity of endophytic fungus was evaluated using the agar well diffusion method against five pathogenic bacteria, including *Staphylococcus aureus* (ATCC-6538), *Streptococcus pneumoniae* (ATCC-6303), *Klebsiella pneumoniae* (ATCC-4352), *Salmonella typhimurium* (ATCC-14028), and *Escherichia coli* (ATCC-8739). In the current investigation, the 25 ul aqueous extract of isolated *Myrothecium roridum* T. was shown to have antibacterial activity against *Staphylococcus aureus* (27 mm), *Streptococcus pneumoniae* (20 mm), *Klebsiella pneumonia* (27 mm), *Salmonella typhimurium* (18 mm), and *Escherichia coli* (29 mm). The maximum zone of inhibition against *Escherichia coli* (29 mm) and the minimum against *Salmonella typhimurium* (18 mm) was shown by the fungus *Myrothecium roridum* T.

Keywords: Medicinal Plant, *Solanum xanthocarpum*, Endophytic Fungus, Antibacterial Activity.

Morphotaxonomic study of wild members of Poaceae from Buldhana district, Maharashtra, India.

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During the present study visited to the different areas of Buldhana district i.e. Malkapur and Khamgaon Talukas; 40 specimens of different grasses were collected. During collection field diary has been maintained. Field characters such as density, frequency, height, habitat, colour etc. were recorded. After collection specimens were dried with the help of plant presser. After drying specimens were mounted on herbarium sheets by stiching. After preparation of herbarium all specimens were observed under stereoscopic binocular microscope. Spikelets were dissected, glumes, lemmas, palea were observed; with the help of standard floras i.e. grasses of Maharashtra by Dr. G.G. Potdar et al., Grasses of Marathawada by Dr. B.W. Patunkar, Flora of Marathawada by Dr. V.N. Naik, Flora of British India by Hooker, and all available literature specimens were identified, after identification all the specimens were described on the basis of actual specimens, during description all the vegetative as well as floral characters were covered.

Keywords: Stereoscopic Binocular, Herbarium Sheets, Vegetative Characters, Floral Characters, Floras, Description.



Occurrence of powdery mildews from Amravati region

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Powdery mildews are more common on cultivated plants and weeds. They grow luxuriantly in dry, warm or cool climate and cause significant destruction and loss in crop plants. Powdery mildews on various crops are caused by the members of family Erysiphaceae.

Survey was conducted to study the diversity of powdery mildew diseases on crop plants and weeds during the year 2017-2018 in Amravati region. Fungi responsible for powdery mildew infection were identified by observing symptoms, macroscopic and microscopic characters of infected plant material. In this study total 11 powdery mildew diseases were recorded on *Bhindi*, *Margosa*, *Sesamum*, *Ber*, *Balsam*, *Teak*, *Ailanthus*, *Euphorbia*, *Cocculus*, *Argemone* and *Parthenium spp.*. Dominant causal agent was recorded in the form of *Oidium spp.* infected five different hosts, while *Erysiphe spp.* infected three different hosts. *Uncinula*, *Sphaerotheca* and *Microsphaera spp.* infected single plant individually. The superficial mycelium of the fungi produced enormous mass of conidia usually on the leaf surfaces. In some of the infections at late-stage fruiting bodies were also observed. At severity of infection, it causes morphological, anatomical and physiological damages to plants.

Keywords: Survey, Powdery mildews, Amravati region.

Phytochemical Analysis and Medico-Ethnobotany of *Capparis grandis* L.F. *Capparis zeylanica* L. from Melghat Region Amravati (MS) India

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Medicinal plants have a history as long as the human civilization. Early Chinese, Indians Hebrews and Egyptian have left us many written records illustrating the medicinal properties of various plants. Ayurveda, one of the most celebrated ancient Hindu systems of medicine is almost wholly based on the plants. Drugs or medicine are obtained from practically all parts of the plants. World plant biodiversity is the largest source of herbal medicine and still about 60-80 % world population rely on plant based medicine and being used since ancient ages as traditional health care system. It is now clear that the medicinal value of *Capparis grandis* L.F. *Capparis zeylanica* L. Lies in the bioactive phytochemical constitute that produce definite physiological effect on human body. These natural compounds signify the base of modern drugs as we use today. The HPLC analysis of *Capparis grandis* L.F. *Capparis zeylanica* L. in methanolic extracts showed presence of essential bioactive phytochemicals. The HPLC chromatogram plant *Capparis grandis* L.F. *Capparis zeylanica* L. in methanolic extracts showed presence of 16 peaks. On the basis of retention time and peak height, it was found that, the plant contain rutin, Quercetin and Caffeic acid. Form the results of the present investigation it can be concluded that, *Capparis grandis* L.F. *Capparis zeylanica* L. having ethno medicinal potential and are being used by various local tribal and local communities to treat various ailments. They are rich in photochemical.

Keywords: Medico-Ethno Botany, HPLC Analysis, *Capparis grandis* L.F., *Capparis zeylanica* L.



Climate Change and Sustainable Development

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The relationship between sustainable development and climate change has been extensively addressed, but with few studies focusing on the Rainforest. This is, by far, the largest rain forest in the world and one of the most pressured by devastation resulting from economic activities. This paper argues that in the future the primary focus of policy research and global agreements should be the de-carbonization of economic development. Consequently, instead of treating climate stabilization and economic development as separate and equal, the strategy should be to re-integrate the two global policy goals, in part by separating responsibility from action. This will require an approach. This is a stock taking piece on the physical and social consequences of climate change, with a specific focus on whether and how climate change via its effects on economic growth, migration, and conflict challenges the implementation of Sustainable development Goals.

Keywords: Carbon Emissions, Climate Change, Sustainable Development, International Cooperation, Adaptation.

Proximate and GC-MS Analysis of Secondary Metabolites from the Stem Bark of *Radermachera xylocarpa* (Roxb.) k. Schum.

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The species under investigation is RET having medicinal attributes. Proximate phytochemical analysis was conducted as per standard protocols. Five different solvents systems were used viz. Water, Methanol, Ethanol, Chloroform and Acetone to scan stem bark. Thin Layer Chromatography (TLC) and Gas Chromatography Mass Spectroscopy (GCMS) analysis revealed presence of various biomolecules having diversified uses.

Keywords: RET, Proximate Analysis, TLC, GCMS, *Radermachera xylocarpa*.



Extraction and application of some natural fabric dyes from Akola region

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Natural dyes are renewable source of colouring materials. They are dyes or colorants derived from plants, invertebrates, or minerals. The majority of natural dyes are vegetable dyes extracted from plant sources such as roots, berries, bark, leaves, wood and other biological sources such as fungi. Besides textiles it has application in colouration of foods, medicine and in handicraft items. In present scenario environmental consciousness of people about natural products, renewable nature of materials, less environmental damage and sustainability of the natural products has further revived the use of natural dyes in dyeing of textile materials. In synthetic dyes, the most common substrate for dye production is petroleum, which is a nonrenewable source of energy. Synthesis generates a large amount of effluent which contains toxic chemicals generated as side products. These dyes also react with various other organic by products of the effluent, forming harmful aromatic complexes that result in mutations and cancers in aquatic animals. Recent studies have shown that dyes have genotoxic, cytotoxic, and mutagenic properties when exposed in greater concentrations to living organisms. They can also cause DNA fragmentations, allergies, skin irritations, and malfunctioning of various organs when acted upon by different biotic and abiotic factors due to the formation of toxic breakdown products. So there is need of significant research work to explore the potentials of natural dyes before its important application to textile substrate.

Keywords: Natural Fabric Dyes, Extraction, Application

A New Fossil Fruit of Asteraceae from Intertrappean Beds of Mohgaonkalan, M.P., India

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Deccan Intertrappean beds of Central India are having classic localities from where many fossil fruits are reported. The fossil fruits are of drupaceous, capsular and berry types are reported but single seeded achene or cypsela are very few. The present fossil specimen is well preserved fruit, is dicotyledonous, single seeded indehiscent oblong to avoid cypsela like. It measures in length 1.45 mm x 1.25 mm in breadth. Pericarp dry differentiate into outer 2 – 3 called thick, epicarp compactly arranged elongated cells. Endocarp thin layer of parenchymatous cells. The fossil fruit described and placed under the family Astraceae. The new generic named is *Asterocarbon deccanii*.

Keywords: Fossil fruit, Intertrappean beds, Asteraceae.



Floral biodiversity of manmade wetland in Akola, Maharashtra.

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The floristic diversity study was carried out at newly formed wetland developed by manmade activity in northern part of Akola city. Field surveys were done in the study area from August 2021 to January 2023 to collect the data of plants of an entire year and to document the richness of floral biodiversity in wetland. This wetland shows rich diversity of plants which belongs to 26 families, which includes some Algae, Bryophyte, Pteridophyte and most of them are Angiosperms consisting of dicots and monocots.

Keywords: Akola Region, Floral Biodiversity, Floristic Study, Wetlands, Wetland Plants.

Study of effect of sodium Azide on seed germination, Chromosomal abnormalities and chlorophyll Variation in *Triticum aestivum* L.Var Aditya (HD2781)

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Present Investigation was carried Out to understand the effect of Mutation on the Seed germination chromosomal abnormalities and chlorophyll variation in *Triticum aestivum* L.Var Aditya (HD2781). the Wheat(*Triticum aestivum*) Was Collected form Local market of Amravati region in the month of December 2022 and done this work in the laboratory of department of botany Shri shivaji Science College Amravati. Uniformly healthy seeds of *Triticum aestivum* L.Var Aditya (HD2781) treated with different condition of sodium azide (Dry, 12hrs+6hrs, 18hrs+6hrs) Seeds of *Triticum aestivum* varity(HD2781) were Soaked to different concentrations of SA Dosage (Control,0.2,0.5,0.8) Of the mutegenic agent sodium azide(NaN₃) for different time periods (Dry,12hrs+6hrs,18hrs+6hrs) Germination percentage for various treatment were recorded from petriplates as well as from the Slots In this result shown that all treatments found to be effective to induce nutrition and generate phenotypic (Chlorophyll variation) as well as genotypic variant it was found that out of all treatments 18 hrs Dry SA treatment found to show significant inhibitory effect on all parameters i.e.seed germination seedling height and chromosomal abnormalities drastic reduction in all parameters were found in sodium azide Seedling survive was found to be decreased with increase in dose of mutagen. These result depicted that with the increase in concentration of mutation there was a decrease in germination percentage of wheat seed percentage germination in control experiment was 100% there where reduction in the germination and survival percentage with increasing concentration sodium azide treatment it was directly proportional to the dosage reduction in the seed germination the data on germination shows the germination decrease with the increasing concentration of sodium azide in the present study effect on the cytogenic changes and decrease mitotic index in all variants the prophase percentage is the highest followed by metaphase telophase and anaphase chromosomal aberration were identified both ana-telophase and metaphase like Disturb Metaphase, Bridge,sticky/Clumped Metaphase prescious Metaphase.

Keywords: Sodium Azide, Mitotic Index, Chromosomal Abnormalities, *Triticum aestivum*.



Economic potential of bioresources derived from *Anisochilus carnosus* (L.f.) Wall.

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Medicinal and aromatic plants are known to be used by 70% to 80% of global population for their medicinal-therapeutic effects as estimated by WHO. In India aromatic plants play an important role in the country's agricultural profile due to their application in various fields. Plants species from the *Lamiaceae* family has been described to be rich in essential oil. The glandular trichomes distributed over the aerial and vegetative organs of plants of *lamiaceae*, are recognized as the site of essential oil biosynthesis. The importance of aromatic chemicals and essential oils in perfumery, can be attributed to the phytoconstituents derived from essential oil. The genus *Anisochilus* have cosmopolitan distribution comprising 16 species mainly distributed in India. Studies on volatile oil of *Anisochilus carnosus* shows presence of camphene, Isocitronellene, Piperitone, Silveterpinol and Linalool through GC-MS and isolation of Menthaol through NMR.

Keywords: Lamiaceae, Essential oil, NMR, Menthol.

Wild Edible Plant in Proximity of Melghat People's Immunity

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Study was conducted in the well known Melghat of District Amravati. The purpose of this study is to investigate the connection between wild edible plant and proximity of melghat people with their immunity power. In this attempt, initially the cross sectional analysis have been carried out, the study analysed the immunity power of people living in tribe of Melghat region were well above then the people present in urban area.

The proximity of these people who consume wild edible plant was found to play the greatest role in their strong immunity. The four plants are *Paspalum scrobiculatum* (kodo), *Panicum sumatrense* (kutki), *Momordica dioica* (kakode), *Chenopodium album* (bathua). The result have been noted in the form of average annual values. and it has been found that these plant significantly give a immune bosting nutrient.

This study definitively answers the question regarding correlation between proximity of melghat people and their high immunity power to have resistance power to various diseases.

Keywords: Wild Edible Plant, Melghat, Immunity.



The first Report on Identification of a New Compound Hederacine- B from the Chloroform extract of *Leonotis nepetifolia* leaves

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Leonotis nepetifolia is one of the most common aromatic plants (Family Lamiaceae) traditionally used for its ethnomedicinal potential. The plant is known for its antibacterial, antifungal, antioxidant, antispasmodic and antiasthmatic potential. The FtIR, NMR and MS study of the chloroform extract of this plant showed presence of hederacine- B. Hederacine- B is the first report from *Leonotis nepetifolia*. Availability of hederacine – B also indicates that the plant might be useful in cancer treatment.

Keywords: Aromatic Plant, Hederacine- B, *Leonotis nepetifolia*.

Qualitative Phytochemical Analysis of *Hygrophila auriculata* from Akola region (MS)

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Hygrophila auriculata is a common ethnoedicinal plant of family Acanthaceae inhabiting marshy places. It is commonly called as Talimkhana in Marathi and being used to treat swellings, jaundice, impotency and general debility. The plant was collected from marshy habitats in and around Akola region. After shade drying, the plant was powdered and then used for qualitative phytochemical experimentation. The plant was found rich in phytochemicals. Alkaloids were founds as major phytochemicals. Flavonoids, terpenoids, saponins, cardiac glycosides were present in moderate amount while tannins and quinones were absent. The presence of rich diversity of phytocompounds supports the ethnomedicinal potential of the plant.

Keywords: Ethnomedicine, *Hygrophila auriculata*, Phytochemicals.



Cytomorphological investigation of an Ecotype- *Emilia sonchifolia* (Linn)Dc. of Family Asteraceae from Akola District

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The present ecotype is species of flowering plants in sunflower family. A cytomorphological work was carried on *Emilia sonchifolia* (Linn)Dc. belonging to family Asteraceae, which plays an important role in ecosystem with rest of the plants. Chromosomal studies are indispensable in cytological analysis. Moreover karyotype analysis have been useful in classifying phylogenetic and evolutionary relationship in related groups. The members of this family are widespread in occurrence and plays a vital role in biodiversity. As per study of biodiversity and cytomorphological course will be examined and found to be $2n = 10$. which is the basic chromosome number. Minute karyotypical findings were recorded. Along with the cytological investigations detailed morphological findings were also recorded for this ecotype. Each and every tribe is playing a crucial role in maintaining biodiversity and we have to conserve it for biodiversity in future. As the present ecotype plays an important role in biodiversity, it is recommended the invitro and in vivo study of ecotype.

Keywords: Asteraceae, Emilia Cytomorphology, Karyotype, Biodiversity, Ecotype.

Investigation on Morphodiversity of *Lilium* L. Cultivars.

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Lilium is one of the member of the family Liliaceae which is distributed throughout the world but mainly Asia and Northern hemisphere. It has 4th ranking in important flower position. From horticulture point of view it is the most significant genera because of its size of flower, beauty, longevity, outstanding range of colour, fragrance of flower. *Lilium* gaining fast popularity in our country due to attractive flowers and having capacity to rehydrate after a long transportation. *Lilium* deserve to be the Aristocrat of the plant world. The present study was intended to find out the distinct morphological variations among the cultivars like Bright Diamond, Eremo and Erclano. The morpho- metric measurements were carried out. The results showed large variations in morphological character.

Keywords: *Lilium*, Asiatic, LA Hybrids, Cultivars, Morphology.



In Vitro Antibacterial Activity of Crude Root and Leaf Extracts of *Clerodendrum infortunatum* Linn.

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The present study was conducted to investigate the antibacterial potential of crude extracts of *Clerodendrum infortunatum* Linn. by disc diffusion method. Ethanol, petroleum ether, acetone, ethyl acetate and aqueous extracts of root and leaf were subjected to antibacterial activity against *Staphylococcus aureus*, *Bacillus subtilis*, *Escherichia coli* and *Klebsiella pneumoniae*. In case of root extract amongst four tested bacteria, only *S. aureus* was susceptible while remaining three were resistant in all the extracts. The ethanol extract of leaf of *C.infortunatum* at 100 µg/ml showed significant activity against *K. pneumoniae* showing zone of inhibition 16.67 mm. *B. subtilis* showed inhibitory activity in petroleum ether and ethanol extracts only while it was resistant in other extracts.

Keywords: *C.infortunatum*, Antibacterial Activity, Disc Diffusion, Zone of Inhibition, MIC.

Inhibitory action of Endophytic fungi from *Hemidesmus indicus* against *Candida albicans*

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Plant endophytic fungi are defined as the fungi which spend the whole or part of their lifecycle colonizing inter-and/or intra-cellularly inside the healthy tissues of the host plants, typically causing no apparent symptoms of disease. In the past two decades, many valuable bioactive compounds with antimicrobial, antioxidant, insecticidal, cytotoxic and anticancer properties have been successfully discovered from endophytic fungi. In present study, a medicinal plant *Hemidesmus indicus* was investigated to isolate the endophytic fungi. Three fungal species ie. *Acremonium fusidioide*, *Nigrospora oryzae* and *Trimmatostroma hughesii* were isolated. Crude extract of these fungal isolates were tested against pathogenic microorganism *Candida albicans*.

Keywords: *Candida albicans*, Endophytic Fungi, Antimicrobial Activity



Indoor Aeromycological Study of Primary Health Centers in Teosa Tahsil of Amravati District.

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There are many biotic and abiotic factors are present in an environment. Abiotic factors like temperature, humidity, light, dust particles, water droplets, pollutants and biotic factors like algae, actinomycetes, fungi, bacteria etc. Aeromycology simply refers to the study of air borne fungi. In the present research attempt were made to determine aeromycoflora of indoor environment of two primary health centers of Teosa Tahsil District Amravati. The sample was collected in the month of December 2022. The main objective of this study was to survey aeromycoflora of PHCs and to determine the frequency of fungi in that indoor environment . The petriplate exposure method was used for the isolation of fungal mycoflora . Total 30 colonies were found in both the PHCs . Out of them *Mucor* sp. and *Cladosporium* sp. was found in highest frequency were as *Alternaria* sp. found in lowest frequency. Two *Aspergillus* sp. were reported out of which *Asprgillus niger* was common in both the PHCs were as *Cladosporium* sp. was found only in one PHCs. *Mucor* and *Cladosporium* sp. was showed dominance all over the indoor environment of both the PHCs. Some of these fungal species were reported as humans pathogens.

Keywords: Aeromycology, Indoor, *Aspergillus* sp., *Cladosporium* sp., Primary Health Centers.

Study of Antifungal and Antibacterial Activity in *Lycopersicon esculantus* L. Var. Capsule (Ragini) by using Ginger and Garlic Extract.

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The study was carried out in the laboratory of botany, in shri Shivaji Science college amravati in (2022) and the field experimentation are situated that vichori in the amravati region. The study was to understand and evaluate the natural effect of garlic (*Allium sativum*), Ginger (*Zingiber officinale*) and the mix of all extracts as a pesticides to inhibit fungal pathogen and bacterial plant pathogen against the agrobacterium tumefacien, Tuta absoluta in f.sp *Lycopersicon esculantus* in tomato in culture media potato dextrose agar (PDA) in vitro. The fungi and bacteria are an important causing significant reduction in yield. In the present study was revealed that in vitro of agrobacterium tumefacien, tuta absoluta was significantly check by extract of ginger, garlic and mix plant extract were used (25.50,100%) at all three concentration. And the result showed that ginger had the highest antifungal activity against agrobacterium tumefacien, tuta absoluta as it inhibited 100% the radial fungus growth (90%) and the result obtained that all concentration exhibited the 10 % aquaous ginger extract has an inhibitory effect on the growth of the agrobacterium tumefacien and tuta absoluta..hence our present work can be used as a new strategy in the field of agriculture to enhance the production as well as the quality of the plant concern.

Keywords: Aqueous Ginger, Garlic and Mix Extract, Antifungal, *Agrobacterium tumefacien*, Tuta Absoluta, *Lycopersicon esculantus* (Tomato).



Study of antifungal activity of *Hyptis suaveolens* (L.) and *Leonotis neptifolia* (L.) of family Lamiaceae

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The present investigation was carried out to study antifungal activity of some of the members of family lamiaceae particularly *Hyptis suaveolens* and *Leonotis neptifolia*. Wild plants were collected from the wild habitat of Anand Nagar district Akola, Maharashtra. The Leaves and the stem of the plants become shade dry and different mixtures were prepared in the aqueous i.e distilled water, methanol and acetone.

It has been found that leaf and stem extract of these two plants in organic solvents show antifungal response as compared with aqueous medium. More resistance to fungal growth were reported in Methanol for both fungal species i.e *Aspergillus* (85%) and *Tricoderma* (71%). However acetone extract shows a comparative less inhibitory effect on *Aspergillus* (71%) and *Tricoderma* (67%) species.

Similar findings were also reported in *Leonotis neptifolia* where Methanol extract shows higher inhibitory activity as compared with the aqueous extract and shows similar potency of antifungal activity for *Aspergillus* (72%) and for *Tricoderma* (72%).

The leaf extract of both the aromatic plants showed antifungal activity against the fungi which are severe pathogens. This proved that the aromatic property of this plant can be used as antifungal agents in the treatment of pathogenic diseases.

Keywords: Antifungal Activity, Aromatic Plants, *Hyptis suaveolens*, *Leonotis neptifolia*.

Phytochemical and GC-MS investigations of plant *Canavalia gladiata* with antibacterial responses

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Canavalia gladiata is widely cultivated in tropical regions of South East Asia with occurrence in Vidarbha and allied regions. It is called sword bean since its fruits have a shape similar to a straw cutter. In folk medicine, its seeds, pods, leaves, stems, and roots are known to have efficacy in treating dysentery, nausea, haemorrhoids, sinusitis, back pain, obesity, diarrhoea, on allergy, inflammation, cancer, gastritis, antioxidant, and skin whitening. In present investigation, the preliminary phytochemical screening reveals the presence of various bioactive phytoconstituents like alkaloids, carbohydrate, protein, amino acids, glycoside, tannins, saponin, flavonoids, steroids, and phenolic compounds. The presence of different phytoconstituents have wide range of significance and used in variety of applications. The secondary metabolites have pivotal role against different stresses faced by the plants. The chemical components from



the methanolic extract of plant was identified by comparing the retention times of chromatographic peaks using Quadra pole detector with NIST Library to relative retention indices. Quantitative determinations were made by relating respective peak areas to TIC areas from the GC-MS. Compounds like Propanal, Furan, 2-methyl- Pyrazolidine, Pentanal, Pivalaldehyde, Decane, Pyrazine, 2-ethyl-6-methyl-, 2,6-Dimethyl-5-aminopyridine, Pyrazine, 3,5-diethyl-2-methyl- were analysed from the spectra. The leaves of *Canavalia gladiata* are the good source of bioactive compounds with antimicrobial potential against different pathogenic bacteria. Present antibacterial study showed about four bacterial strains with capacity of the phenomenon of antibiosis. The species *Escherichia coli*, *Klebsiella pneumonia*, *Enterococcus* showed the higher antimicrobial activity then by *Staphylococcus aureus* and *Pseudomonas aeruginosa* in different extract. This primary data of evaluation of antimicrobials will be helpful for future researchers for further exploration of diverse potential of the plants in the field of pharmacology and herbal medicine.

Keywords: Phytochemicals, GC-MS analysis, Antibacterial activity

Mass Production, Formulation Techniques and Applications of *Trichoderma* spp. on Crop Plants

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Trichoderma is an antagonistic fungus known to occur in soil and root ecosystem. *Trichoderma* species are recognized as biological agents to protect crops against several soil and air-borne diseases such as – root rots, seedling blights, damping off, charcoal rots, wilts, downey mildews and other soil-borne, fungal and nematode diseases. *Trichoderma* is useful for all types of crops and can be applied as seed treatment, root dips, soil treatment and foliar applications.

In present study, for mass production of *Trichoderma* spp. solid state fermentation technique was used in which fungus was grown on *Sorghum* grains. These products are used mainly for direct soil application in nurseries / main fields to suppress the soil-borne inoculum. Also, *Trichoderma* formulations can be applied to the seeds by dry seed treatment for control of several soil-borne diseases caused by pathogens like - *Rhizoctonia*, *Sclerotium*, *Fusarium*, *Pythium* and *Phytophthora*. For seed treatment, Talc based formulation and spore suspension was applied in case of biological control of crop diseases. For disease management applications, *Trichoderma* is implemented in the form of seed treatment, seedling dip, root treatment and soil application.

Keywords: Mass Production, Formulation, Applications, *Trichoderma* spp.



Diversity and Distribution of Wild-Mushroom from Nandgaon khandeshwar area of Amravati district.

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Fungi are an integral part of an ecosystem which plays a very significant role in carbon and nutrient cycling. Mushrooms are the macrofungi which possess beautiful umbrella like fructification which bear spores on the gills. A survey has been conducted in the month of August 2022 to know the diversity and distribution of mushrooms from the Nandgaon khandeshwar taluka of Amravati district. As there is no any documentation on mushroom from this area. The objective of the study was to explore the diversity of mushroom from different areas of Nandgaon taluka. The study has revealed a total 6 different species belonging to *Leucocoprinus sp*, *Schizophyllum sp*, *Daldinia sp*, *Coprinus sp*, *Trametes sp*, *Fomitopsis sp*. The further detailed study is require for the exploration of wild mushrooms which opens new way for researchers.

Keywords: Biodiversity, Fungi, Mushroom.

Fungi involved in biodeterioration of papers in college library

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Paper biodeterioration by fungi has always been a common problem in archives, libraries and museums. The decomposition of cellulose by cellulolytic fungi is mainly due to the production and secretion of a complex of extracellular enzymes - cellulases - which hydrolyse the cellulose macromolecule into small water-soluble sugars which can then be processed by the fungi. Moreover, they can discolour ink by means of the tannages or produce paper staining pigments and organic acids, which may induce discolouration and damages to the paper. Degradation of paper can be accelerated by endogenous factors like acidity, metal ions, lignin or paper degradation products, and exogenous factors like temperature, humidity, radiation, oxygen, pollutants or biodeteriogens.

The current study aims to isolate, identify and explore fungal strains responsible for paper deterioration. The deteriorated paper samples were collected from library of college and the paper surface was photographed. To study and isolate the responsible fungi sterilized cotton swabs and impression method was implemented. Some filamentous fungi like- *Aspergillus niger*, *Aspergillus versicolor*, *Aureobasidium pullulans*, *Chaetomium globosum*, *Cladosporium cladosporioides*, *Alternaria alternata*, *Fusarium oxysporum*, *Penicillium chrysogenum* and *Penicillium citrinum* were found associated with deteriorated paper. These fungal strains produced several hydrolytic enzymes with high activity, such as cellulase, amylase, gelatinase and pectinase, which play a key role in biodegradation. The findings show that the paper exhibits variety of deterioration signs including colour change, brittleness and weakness of the paper.

Keywords: Fungi, Paper Biodeterioration, Library Books.



Phytochemical's screening of medicinal plants and interaction studies against SARS-COV-2 RNA-dependent RNA polymerase (RdRP)

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Viral infections may cause life threatening diseases and severe acute respiratory syndrome, corona virus 2 (SARS-2) is one of them. SARS CoV-2 is the causative agent of the pandemic disease COVID-19. Eight major target proteins (spike protein, RNA-dependent RNA polymerase (RdRP), envelop protein, membrane protein, protease, nucleocapsid protein, hemagglutinin esterase, and helicase) are identified, targeting which drug can be designed. In the present study, we have performed *In-silico* docking screening against RdRP. Initially using Raccoon Autodock tool, 10733 medicinal plant's phytochemicals were screened by following Lipinski's rule. Selected 5299 structures were screened by using AutoDock Vina to determine the binding affinities and interactions between the phytochemicals with RdRP. Best 10 potential inhibitors are reported based on the least binding affinities scores for different active cavities of RdRP. The comprehensive computational and statistical analysis showed that the selected phytochemicals from medicinal plants can be used as potential inhibitors against the SARS CoV-2 and future implementations may lead to improved accuracy.

Keywords: Drug Designing, In-silico Screening, Medicinal Plants, Docking, SARS-2, COVID-19



Evaluation of Analgesic and Anti-Inflammatory Activities of Formulation Containing *Curcuma amada*, *Allium sativum*, *Ricinus communis*, *Sesamum indicum*

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Rheumatoid arthritis is an autoimmune disease in which there is joint inflammation, Synovial proliferation and destruction of articular cartilage. Inflammation is a bodily response to injury, Infection or destruction characterized by heat, redness, pain, swelling and disturbed physiological functions. India is the forerunner country in the formulation and practice of use of various plant based crude drugs for the treatment of variety of diseases. These plant based crude drugs are derived from plant secondary metabolites.

In the given study we have formulated potent anti-inflammatory and analgesic oil from *Curcuma amada*, *Allium sativum*, *Ricinus communis*, *Sesamum indicum* to reduce the inflammation and reduce the pain. We have studied anti-inflammatory activity of oil by Protein denaturation and HRBC membrane stabilization also carried out biophysical and biochemical testing of oil and survey of efficiency of oil against inflammation.

Keywords: Rheumatoid Arthritis, Anti-Inflammatory Activity, Protein Denaturation.

Plant Extract Mediated of ZnO Nanoparticles by Using Ethanol Extract of Aegle Marmelos Leaves

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Nature and nanotechnology have not yet achieved a lucid correlation in the field of science but together they have exhibited immense potential towards the advancement and modification in future science and technology. Due to the unique properties of nanomaterials like nanoparticles gained considerable importance. The objective of the present work is to develop a procedure for obtaining ZnO nanoparticle via complex formation with plant extract. Aegle marmelos leaves were utilized as template for synthesis of ZnO nanoparticle. The ZnO nanoparticles subjected to UV-Visible, FTIR, XRD and SEM analysis. The presence of phenolic group in extract has the capacity to form ZnO nanoparticles and act as stabilizing agent. The optical features were typical of ZnO nanoparticles with excitonic peak at 371nm from their absorption spectra and band gap E_g energy found to be 3.34eV. It was confirmed from the XRD pattern that the structure of ZnO nanoparticles is crystalline and the average crystal size of ZnO nanoparticle is 36.40nm. FTIR analysis proved that the particle is of biological origin. The SEM analysis displayed a fine spherical ZnO nanoparticle and size of ZnO nanoparticle 47.82nm.

Keywords: ZnO, Nanoparticles, Green synthesis, UV-Vis, XRD, FTIR, SEM, Aegle Marmelos.



A microscopic view of various green, rod-shaped bacteria, likely cyanobacteria, showing different morphologies and arrangements. The background is a light green gradient.

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Green synthesis of novel triazine and their metal complexes as potent antimicrobial agents

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Triazines hold a specific place among the great variety of nitrogen containing heterocyclic compounds. Metal complex of newly synthesized triazines demonstrate a large range antimicrobial activity. Synthesis of metal complex by green synthesis method by using microwave technique. Tridentate chelate complex of ML type [M= Cu (II), Co(II), Cr(II)] have been synthesized from triazine based ligand. Structures of the products have been deduced from their elemental analysis and spectral data (IR, ¹H-NMR, XRD). Select new synthesized compounds were screened as antimicrobial activity against *Escherichia coli*, *proteus mirabilis*, *Staphylococcus aureas*, and *A. niger* has been carried out and compared with standard one.

Keywords: Heterocyclic, Tridentate, Chelate, Antimicrobial Activity.

Management of Municipal solid waste and Production of Manure from MSW

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The ecological imbalance leads this universe to natural calamities. Our green earth, being an important part of this universe, it is our primary duty to protect its environment, clean, healthy and safe for living. Modern human life, pollute our surroundings making our life miserable day by day. The term Municipal Solid Waste (MSW) describes the stream of solid waste ("trash" or "Garbage") generated by households and apartments, commercial establishments, industries and institutions. Solid waste can be classified in to different types depending on their source; Household waste is generally classified as municipal waste, Industrial waste as hazardous waste and Bio-medical waste or hospital waste as infectious waste.

Keywords: Impacts, Role, Infection, Treatment.

Formazan Derivatives Study of Physicochemical Properties and Effect Of Electronic Factor On Their Antimicrobial Activity

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In present work formazan derivatives were prepared through the reaction of benzaldehyde-phenylhydrazon with substituted aniline. The structure of the formazan derivatives were fully established by physical and spectral methods. The study was extended to antimicrobial activity and physicochemical measurements at different concentration in binary solvent system. In viscometric study it was observed that viscosity of solution increases with increase in concentration. Positive value of B-coefficient may



attribute to strong solute-solvent interaction on other hand value of A-coefficient is almost negative which indicates weak solute-solute interaction. Study was extended to find conductivity of synthesized derivative in different solvents. Formazan derivatives 4-phenyl – (4 nitrophenyl)-5-phenyl and 4-phenyl –(4 chlorophenyl)-5-phenyl showed best activity against *Staphylococcus aureus* and poor activity against *Escherichia coli* bacterial strains.

Keywords: Formazan derivative, Viscosity, Conductivity, Antimicrobial activity.

Antimicrobial study of N Benzothiazolyl- substituted pyrazoles

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Benzothiazole--yl -3,5-disubstituted pyrazoles (3a-f) implemented for their antimicrobial activity study. The antimicrobial activities of these synthesized compounds are done by agar disc diffusion method at two different concentrations in DMSO against gram positive bacteria *Staphylococcus aureus* and gram negative bacteria *Escherichia coli*. Structures of all the newly synthesized compounds were confirmed by their IR, ¹H-NMR and CHN analysis. From the synthesized compounds 3a,3b,3c biologically active *Escherichia coli* and *Staphylococcus aureus*.

Keywords: Antimicrobial, N Benzothiazolyl, Substituted Pyrazoles.

Structural and Antimicrobial Study of 3- Acetyl Coumarin

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3- acetyl coumarin is synthesized by Knoevenagel cyclization in polar solvent. 3-acetyl coumarin is structurally characterized by FTIR, it shows the characteristic peaks for aliphatic & aromatic C-H stretching, prominent peak for carbonyl group as well as the peak for aromatic C=C stretching. This confirms the formation of 3-Acetyl Coumarin. To check its purity HPLC studies were carried, HPLC data shows the high degree of purity with sharp peaks and 100% area. The biological activity of 3-acetyl coumarin was tested against *K. Pneumoniae*. it shows the inhibition Zone value of 28. Which confirms the bioactivity of 3-acetyl coumarin.

Keywords: 3- acetyl coumarin, Knoevenagel Cyclization, FTIR, HPLC, *K. pneumoniae*.



A Review Based Study on the Working of Data Analysis Tools

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In the world of the internet various social networking sites, business sites, mobile applications etc produce large volumes, variety, velocity of data which we call big data. Selection of relevant and proper data is the essential thing for the purpose to which they are to be used and to get the desired output. Scale of Data, area of interest, validation process of data, quality and accuracy in the data etc. all are essential in data selection and its analysis process. Data analysis tools are helpful to integrate and analyse big data systematically. There are various tools that are used for different kinds of analysis of data. The different applications of data analysis are statistical analysis, map data analysis, diversity data analysis, geographical data analysis, spatial data analysis, etc. The main aim of this paper is to focus on various data analysis tools and their application areas.

Keywords: Big Data, Data Analysis, Tools.

‘Impact of Mining on Environment’ Indian Perspective

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Mining is the industry or activity of removing substances such as coal or metal from the ground by digging. Even though it may not seem very common on first world countries, material extraction is a very common activity and find it almost everywhere. Mining operations include the extraction of minerals and metals such as copper, tin, nickel, bauxite, iron ore, gold, silver, and diamonds from Earth’s surface as raw materials for the manufacture of other products and commodities. Mineral exploitation contributes significantly to economic growth and development in most world economies in all over the world. The distressing effect of mining on the environment is expected and based on the data analysis of factors of the environmental disasters caused by the mining operations. This research paper systematic study has been carried out the influences of mining on land resource, ecological system, geological, hydrological and ecological environment the environment and ecological system.

Keywords: Environmental Impact, Ecology, Mineral Exploitation.



Photo finish for skin cure: Photo therapy

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Phototherapy is a treatment for dermatological diseases with the help of sunlight or artificial light. Phototherapy is proved to be effective treatment as far as dermatological and other skin diseases or skin care or cosmetic treatments are concerned

Phototherapy are used as a multiple disease treatment methodology. Ultraviolet-A, UV-A and Ultraviolet-B UV-B lights are of medically important treatment wavelengths. Ultraviolet light in the wavelength range of 308-311nm is most accepted standard wavelength for especially dermatological treatment.

Herewith we mention the treatment of three patients for treatment of lighter vitiligo patches with NBUV-B unit with peak emission of 311 to 312 nm wavelength with whole body TL-100W/01, Philip, Eindhoven, Netherland having 48 fluorescent tubes.

With the co-ordination and guidance of a team of dermatologists we experienced the treatment which lasts long for 16 to 20 weeks. All the patients showed complete positive results with steady recovery which was ensured with photograph of high precision camera.

Keywords: Photo finish, skin cure, Photo therapy.

Study of SEM and TG/DT Analysis of PEO: PVP: NaCl Based Polymer Electrolyte

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The polymer electrolyte PEO: PVP: NaCl was prepared by solution cast technique. Polymers PEO, PVP, NaCl were taken separately at three different ratio with as (40:50:10), (35:50:15), (30:50:20), (25:50:25), (20:50:30) and (15:50:35). Experimental technique such as electrical conductivity measurement in the temperature range 313K to 343K and transference number measurement were used to characterize this electrolyte. Here 25 wt. % of NaCl has the highest conductivity. These electrolyte then analyzed by SEM and TG/DTA technique and different values are evaluated in the table.

Keywords: Polymer Electrolyte, PEO, PVP, NaCl.



Green synthesis of carbon dots from spinach and curry leaves & their application

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Carbon dots (CDs) have received an increasing amount of attention because of their significant advantages in terms of low toxicity, chemical inertness, tuneable fluorescence, good water solubility, and physicochemical properties. Green syntheses methods for preparation of materials comprising exclusively of renewable raw materials or renewable refined compounds are gaining preference over traditional approaches that make use of harsh chemicals and energy intensive conditions. Highly fluorescent CDs have been prepared from natural curry leaves and Spinach by a hydrothermal method. In this work, we have studied effect of particle size and concentration of CDs on its luminescent properties. As it is well known that CDs exhibits high fluorescent contrast and low toxicity in cells the CDs prepared in this work can be used for fluorescent ink, biosensors and bioimaging.

Keywords: Green Synthesis; Spinach and Curry Leaves; Carbon Dots; Fluorescence.

Preparation and Characterization of UV Emitting Sr₂P₂O₇:Gd³⁺ Phosphors for Phototherapy Application

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In the present paper, a Gd³⁺ doped Sr₂P₂O₇ phosphor was synthesized by Stearic acid sol-gel method. The phosphor was characterized by X-ray diffraction (XRD), Photoluminescence (PL). The Phase purity and crystallinity of phosphor is confirmed by X- ray diffraction (XRD) analysis, while surface morphology studied by scanning electron microscopy (SEM). The photoluminescence properties of the sample Sr₂P₂O₇:Gd³⁺ was investigated by excitation and emission spectra. The PL excitation spectra of Sr₂P₂O₇:Gd³⁺ phosphor exhibits broad spectra having high intense peak at 274 nm. Under UV excitation (274 nm), Sr₂P₂O₇:Gd³⁺ shows emission peak at 312 nm. The obtained results show that the prepared phosphor is suitable for Phototherapy application.

Keywords: UV Emitting, Phosphors, Phototherapy.



Optically Stimulated Luminescence properties of $\text{NaLi}_2\text{PO}_4:\text{Ce}^{3+}$ Phosphor

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Orthophosphate $\text{NaLi}_2\text{PO}_4:\text{Ce}^{3+}$ synthesized via modified solid state diffusion method. The prepared phosphor was characterized through XRD and SEM. And discussed its photoluminescence (PL), optically stimulated luminescence (OSL) properties. The PL excitation and emission spectra of prepared $\text{NaLi}_2\text{PO}_4:\text{Ce}^{3+}$ phosphor were observed at 358 nm and 312 nm respectively. The CW-OSL measurements were carried out under the blue stimulation (^{90}Sr β source). In OSL mode, sensitivity of prepared phosphor was found to be 4.6 times greater that of $\alpha\text{-Al}_2\text{O}_3:\text{C}$ (BARC) phosphor. The linearity, reusability, Minimum Detectable Dose (MDD), fading was studied. The effective atomic number (Z_{eff}) of prepared $\text{NaLi}_2\text{PO}_4:\text{Ce}^{3+}$ phosphor is 10.8 and phosphor shows excellent OSL dosimetric properties. Hence the phosphor has potential to become a suitable candidate for OSL radiation dosimetry.

Keywords: $\text{NaLi}_2\text{PO}_4:\text{Ce}^{3+}$, OSL, Radiation Dosimetry.

Role of Microfinance Using Regression Analysis for Women's Economic Empowerment

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The evolution and blooming of any economy depend on the economic and social empowerment of its occupiers. Now day Microfinance plays a very wide role to empower the poor. Also, microfinance is a tool to boost women's empowerment. This paper reviews the literature based on women's empowerment. It can see the productive or rejective proof and dares link to the uplift the living and existence of the poverty. For this study, almost 330 microfinance customers were approached for filling up the questioner for the study. Out of these 330 respondents, 300 responded well and completed the questionnaire with the required attention.

The data collected has few outliers, as we can see in the boxplot given below. To overcome the effect of outliers the natural log of the per capita income before and after has been calculated and used in further analysis to create models.

Keywords: Microfinance, Regression Analysis, Women's Economic Empowerment.



A Study of Sustainable Development Goals Related to Agriculture Sector & Application of Critical Path Method

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The Sustainable Development Goals (SDGs) are the most widely supported development goals the world has ever established. These 17 goals and 169 targets provide a concrete framework for tackling the issues like poverty, hunger, gender inequality, education, environmental damage etc. The 17 Sustainable Development Goals & their 169 targets, form the core of the 2030 Agenda. It aims at tackling multiple and complex challenges faced by humankind. The main target of UN is to achieve these goals in every sector from the year 2016 to 2030. So, it is important and necessary to analyze and identify the direction of economic development and for this it is required to analyze a set of indicators and parameters to monitor measure and describe sustainability. For India adoption of global development strategies appears to be a challenge but also a major requirement in economic, political, social and environmental process. Agriculture acts as a backbone of our country. It plays an important role in India's growing economy. So, the agriculture sector must be studied from SDGs point of view. Broader objective of the study is to build a CPM model to define critical and non critical tasks for preventing project schedule problems in Agriculture sector.

Keywords: Sustainable Development Goals, Agriculture, Optimization Techniques.

Assessing the Water Quality Using Physico-chemical Parameters of Van Project Dam District Buldana, Maharashtra.

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This Paper Present to study of the Physico-chemical Parameters of Van project dam district Buldana, Maharashtra. Monthly Changes In Physical and Chemical Parameters Such as Water Temperature, Transparency, Turbidity, Total Dissolved Solids, pH, Dissolved Oxygen, Free Carbon dioxide, and Total Hardness, Chlorides, Alkalinity, Phosphate and Nitrates. Were analyzed for a periods of one year from 1st January 2022 to 31st December 2022. All Parameters were within the Permissible limits. The results indicate that the Dam is Non-polluted and can be used for Domestic, Irrigation purpose.

Keywords: Van Project Dam, Physico-Chemical Parameters, Monthly Variation.



Estimation of Noise Pollution in Akola City

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The present paper deals with an assessment of atmospheric conditions and noise level at Akola city during the months of January to June of year 2022. The sites selected for experimentation includes Railway Station, Bus Stand, Civil line Square, Sindhi camp Square, Jawahar Nagar Area, Akot Road and old city Square. The results shows that the noise pollution level at some sites are exceeding the standard limit particularly at Railway Station, Bus Stand, old city Square Area and Akot Road whereas Jawahar Nagar Area show certain parameters within limits. Decibel Meter was the device used for the experimentation. The assessment of monitoring system therefore would prove very useful to control the noise pollution.

Keywords: Noise pollution, Gajanan Maharaj Mandir, Decibel Meter, Sound level.

Groundwater potential zone mapping in Aurangabad, Maharashtra using remote sensing, GIS, and MIF techniques

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To identify groundwater potential zones in Aurangabad, Maharashtra, this article addresses the manipulation and analysis of each layer of spatial control data using remote sensing and geographic information systems. Groundwater occurrence in drought prone locations varies across time and space because of climatic patterns, topographical factors, and aquifer properties. For the sustainable management of water resources in these contexts, detailed delineation of Groundwater Potential Zones (GWPZs) is essential. By combining geographic information systems (GIS), analytical hierarchy method, and remote sensing (RS), the current work aims to discover and assess GWPZs in drought prone areas (AHP). In the following categories: Rainfall, LULC, Geomorphology, Soil Classification, Lineament Density, Drainage Density, and Slope, seven thematic layers were developed. The study's findings suggest that the AHP model will be more accurate in determining the GWP. The stakeholders would gain from any groundwater management projects done in this advantageous area. The present study divides the Aurangabad district based on the result in the four different categories i.e, Poor (6.3%), moderate (35.2%), and Good (56.6), Excellent (1.9).

Keywords: Groundwater Quality, Groundwater Potential Zone, Marathwada, AHP, MCDM.



Eco-Friendly Handmade Paper Production Using Waste Paper.

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The goal of this study is to convert as little waste paper as possible into handcrafted, biodegradable paper. We try to find a solution on waste paper to convert eco-friendly handmade paper at home using some household items and naturally based colours like some beet root, turmeric, a green plant juice, etc. as we see over-exploitation of trees for the formation of paper making, and demand for the paper product increased tremendously. We use scrap paper that has been cut into small bits and soaked in water for at least 2-3 hours to produce handmade paper that is environmentally friendly. After that, grind, combine, or mortify paper scraps to create a fine pulp. Paper pulp is poured to the large container that already has a substantial volume of water and thoroughly mixed to create a paper sheet. Take a sieve and run it through the pulp and water-filled container before setting it aside. until the right pulp had settled on the sieve. After some time, press gently with a cloth on the sieves to absorb any excess water, and then gently tap the sieve to remove the paper from it. Eco-friendly handmade paper that has been thoroughly dried by the sun is now usable. We may use natural colours found in a variety of plants, such as beet root, turmeric, green plant juice etc. to create coloured, eco-friendly handmade paper.

Keywords: Waste Paper, Eco-Handmade Paper, Natural Colour.

Biosorption of Zn(II) and Pb(II) Ions From Water and Waste Water Using by Low-Cost Biosorbents: A Review

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Heavy metals are a unique group of naturally occurring compounds. Their continuous release leads to overconsumption and accumulation. As a result, people around the globe are exposed to adverse consequences of these heavy metals. Toxic heavy metals, which are of concern, are chromium (Cr), lead (Pb), zinc (Zn), arsenic (As), nickel (Ni), cobalt (Co), cadmium (Cd), mercury (Hg), and so on. Industrialization to a larger degree is responsible for the contamination of environment especially water where lakes and rivers are overwhelmed with a large number of toxic substances. Over the last few decades, many conventional treatment methods have been used for the removal of heavy metals from contaminated wastewaters. The commonly used methods include chemical precipitation, ultra-filtration, ion exchange, reverse osmosis, electro winning, and phytoremediation. Biosorption has emerged as an attractive option over conventional methods for the removal of heavy metal ions from effluents discharged from various industries which ultimately reach and pollute fresh water bodies. In view of the disadvantages associated with conventional methods for metal removal, there is a need for alternative, cost-effective technologies. In recent years, biosorption /bioaccumulation processes have been considered as novel, economic, efficient, and eco-friendly alternative treatment technologies for the removal of heavy metals from contaminated wastewaters generated from various industries.

Keywords: Bio-sorption, Bio-degradation, Bio-sorbent Materials, Heavy Metals.



Assessment of the Airborne Fungi, in Rainy Season from some Schools of Amravati City.

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Fungi are widely spread and play a vital role in human everyday life. The microflora of any habitat varies with host type, seasonal variations in climatic conditions and relations among them. Thus, the diversity of microflora differs from time to time and place to place. Fungi had a capacity to grow on mostly all natural and synthetic materials, especially if they are wet or hygroscopic.

In this study the fungal contribution in indoor environment of 3 schools of Shivaji Education Society Amravati was carried out during rainy season. For this study, settle plate method was used for the isolation of fungi. Sampling site-1 were isolated highest number of fungi (2737 cfu/m³), the second number highest was isolated from Sampling site -2 (2642 cfu/m³) & Sampling site -3 (2406 cfu/m³) were found to be least in number. During the investigation period of rainy season. *Aspergillus* sp., *Alternaria* sp., *Cladosporium* sp, *Penicillium* sp. prominently isolated from school.

Keywords: Airborne Fungi, Indoor and Outdoor School Environment; Fungal Distribution.

The therapeutic potential of traditional and functional food.

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Let food be thy medicine and medicine be thy food.” is a well-known quote by Hippocrates, the father of medicine. “Food as medicine” is emerging as an important concept in managing health and wellness. Foods prepared for festivals are seasonal foods and hence best for consumption. As per the mythology of Ganesha faced a lot of irritation and acidity, attributable to a heavy meal following consumption the demon Anasur. To relieve the discomfort, when everything failed, durvas provided relief by maintaining the alkalinity of the body, hematinic and a natural blood purifier.

Indian physician, Sushruta, use to treat the surgical infection with ladoos .Thebesan-laddoos served have a low glycaemic index and hence may help to satiate sweet cravings without too many calories assisting for in weight loss. Food ingredients with nutritional properties like sesame seeds, jaggery, and peanuts that we call til-ladoo, used during Makar Sankranti and is a considered a super food for winter. Turmeric, ginger and garlic are excellent herbs for every season, especially during the monsoon because of altered immune resilience. Banana, jackfruit, guava, mango, bael, custard apple are some of the examples offered by the nature during the season provide health benefit. Indian food, across all regions, is balanced, extremely beneficial, and nutritionally rich, containing antioxidants, essential minerals, and vitamins that help in digestion, speed up metabolism, and improve cholesterol and blood glucose levels. In addition to energy certain foods provide positive health benefits and help to prevent, mitigate and relieve the life style disorders. Although technology assisted better storage facilities have made tall the food types available throughout the year, traditionally we can find correlation between seasonal food and fruit consumed during the festivals and health. **Keywords:** Therapeutic, Potential, Traditional, Functional Food.



Mapping of vegetation and identification of groundwater potential zone using GIS and Remote Sensing

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Natural resources are the most valuable things on the earth and they are essential for the survival as well as development of the human. Air, water, soil, vegetation and minerals are the most natural resources that makes life possible on the earth. Groundwater is an important resource contributing significantly in total annual supply. However over-exploitation has depleted groundwater availability considerably and also led to land subsidence at some places. GIS based mapping of vegetation is broadly established application with strong inter connections with remote sensing, digital, surveying and mapping as well as with more traditional approaches of mapping and cartography. In this study a standard methodology is proposed to determine groundwater potential and mapping of vegetation using integration of RS & GIS technique. The accurate information to obtain the parameters that can be considered for identifying the groundwater potential and mapping vegetation such as geology, slope, drainage density, geomorphic units and lineament density are generated using the satellite data and survey of India (SOI) top sheets. It is then integrated with weighted overlaying Arc GIS. Suitable ranks are assigned for each category of these parameters. The groundwater potential zones are classified into five categories like very poor, poor, moderate, good & excellent. The use of suggested methodology is demonstrated for a selected study area in Amravati district of Maharashtra.

Keywords: Mapping, Vegetation, Identification, Groundwater, GIS, Remote Sensing.

Environmental impact assessment: Retrospect and prospect

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The widespread experience of environmental impact assessment (EIA) as an anticipatory environmental management tool has generated a considerable debate over the extent to which it is achieving its purposes. Environmental Impact Assessment (EIA) is a process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human-health impacts, both beneficial and adverse. It aims to predict environmental impacts at an early stage in project planning and design, find ways and means to reduce adverse impacts, shape projects to suit the local environment and present the predictions and options to decision-makers. By using EIA both environmental and economic benefits can be achieved, such as reduced cost and time of project implementation and design, avoided treatment/clean-up costs and impacts of laws and regulations.



An Environmental Impact Statement that provides clear, understandable, relevant information to influence the final decision on the development project. A better development project (minimised negative impacts, maximised positive impacts, optimal location, best alternative selected, etc) EIA often focuses on biophysical issues (often a fault of poor terms of reference); Where environment, social and economic aspects are addressed, they are not always addressed in an integrated way (EIA reports tend to present as separate chapters) .EIA provides an opportunity to learn from experience of similar projects and avoids the (often high) costs of subsequently mitigating unforeseen negative and damaging impacts. EIA Improves long-term viability of many projects.

Keywords: Environmental Management Tool, EIA, Impacts.

Prospective of Green Audit in Environmental Management

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Green Audit is a way to show what type of carbon footprint they are leaving on the environment, while also giving them ways to reduce it. Green audit involves the inspection of a college campus to assess the total environmental impact of its activities. There are many situations human activities have significant effect on the college campus to successfully achieve its vision and mission. Evaluation of impacts on the natural resources within the premises due to the routine activities of the organization also adds a value to the sustainable development of organization. The present evaluation of the environmental resource (air, water, soil) of Shri Shivaji Science College Amravati was carried out to study the impact of institutional activities on this resource. The results revealed that the air, water and soil quality and noise level are well within the prescribed limit and hence the college can be considered as a green and place with the ideal environment for higher education as on today. However, continuous and regular monitoring of environmental quality in the future is important to ensure the development with the green practice inside the campus.

Keywords: Environmental Management, Green Audit, Sustainable Development.



Geoenvironmental Resource Assessment of Amravati District using RS & GIS Technique

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In the current scenario of development, the natural resources are being exploited indiscriminately leading towards the degradation of the environmental ecosystem causing global warming, floods, and droughts across the world. The situation calls for the implementation of appropriate measures to restore and conserve the existing ecosystem. The importance of ecosystem services to human well-being for the present and future generations has been a matter of concern for land managers, environmental scientists, and decision-makers. The issues of sustainable development are associated with the objectives of achieving desired growth for economic or social reasons on one hand with safeguarding the environment and maintaining a good quality of life on the other. In the process of development, the geoenvironmental components may degrade and therefore needs to be addressed with adequate attention and proper reinstatement measures. To assess the geoenvironmental potential of Amravati Dist. Studies has been carried out for geology, geomorphology, Hydrogeology, Hydrology, soil and land studies and generate proper database for the study of area. Few major steps which carried out in Project are data collection based on maps, GIS & Remote Sensing, ground data collection, data analysis, & generate a proper database. The geological map of the study area shows that it is covered by varied geological formations such as basaltic lava flows covering the northern part of the catchment area which are overlain by Quaternary sediments viz. Piedmont zone (Bazada zone) and the alluvium covering the southern part of the area , The thematic map on geomorphology reflects that the older alluvial plain, formed due to the deposition of river sediments, is widely distributed and has covered an extensive area of 262.15 km² (50.30% of the total area). The map on land use/land cover for the study area is prepared from the IRS-P6 LISS III satellite image data (acquisition in October 2015), by executing the maximum likelihood classification algorithm technique. The work on groundwater quality in the study area has been attempted earlier by various researchers. This was the preliminary study of the Geoenvironmental Resource Assessment of Amravati Dist. but there is too much potential of extensive and comprehensive exploration of the resources.

Keywords: Geoenvironmental Resources, RS, GIS, Amravati, Maharashtra



Effect of Organic and Inorganic Fertilizers Application on Soil and Soybean (Glycine max.) Plant.

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The application of organic and inorganic fertilizer to the soil is considered as good agricultural practice because it improves the fertility of the soil and plant quality. The field experiment was conducted in the Amravati. With two treatments comprised of 100% of recommended levels of N, P, K and organic sources FYM were applied. The results showed that the highest yield of soybean uptake of nitrogen and phosphorus in treatment and potassium, sulphur was recorded with treatment applied 100% NPK of recommended NPK fertilizers. The experimental results of this study have showed that organic fertilizer produced higher nutritional values on *A. (soybean Glycine max)*. Plant (leaf, stem,) when compared with inorganic fertilizer.

Keywords: Organic, Inorganic Fertilizer, Soybean Nutritional Values.

Assessment of physicochemical parameters of Bor Dam, Mouje-Angoda in Amravati District, Maharashtra, India.

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On the earth fresh water available in dams, reservoirs, lakes, streams, rivers etc. are primarily used for drinking, irrigation, industrial and for various domestic functions and for transportation, fishing, energy, etc. The Bor reservoir is one of the fresh water resources available in the Amravati district of Vidarbha region. It furnishes water for drinking and irrigation purpose to many villages and reliable source for fishery. It is absolute necessary and foremost important to investigate the water before it is used for drinking, domestic, agricultural, or industrial purpose. The present study was conducted a primary aimed to investigate that the water quality is in compliance with standards and to check water quality suitable for drinking and domestic purpose of Bor dam reservoir. The health of water was evaluation by analyzing some physicochemical parameters such as pH, turbidity, TDS, hardness, chloride, alkalinity, EC, nitrate etc. The investigation results show that, the water of Bor dam is likely unsuitable for drinking purposes without any form of treatment, but for several other usage of surface water usage purposes, it still could be considered quite preferable. Bor dam water must be treated previously using it for drinking purpose.

Keywords: Assessment, Physicochemical, Bor Reservoir.



Physico chemical analysis of borewell water from Priya township area, Amravati

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Water is an essential natural resource for sustaining life and environment that we always thought to be available free and plentiful gift of nature. Ground water is the water located beneath the ground surface in soil pore spaces and in the fractures of lithological formation. Ground water makes about 20% of the world supply. Borewell is a deep well having diameter of about 50 mm to 20 mm and it obtained its quota of water from a number of aquifers and well-constructed by boring process. In present study borewell sample is taken from Priya township area from Amravati. The sample was taken by grab sampling method. The borewell sample is collected from two sites of Priya township. water samples were collected and their physico chemical parameters were analysed. After analysis of physico chemical parameters of the water sample the result shows that all the parameters are within permissible given by WHO standards. Thus, it is concluded that water from Priya township area is safe for drinking purpose.

Keywords: Borewell Water, Physico Chemical Analysis.

Biomining of Legacy Waste: Innovative Transformation of Urban Waste Mountain

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Waste management in urban areas can pose manifold challenges that can threaten the goal of achieving sustainable development in the cities. The need of the era is to assess the existing waste management practices in our cities and explore new innovative alternatives to develop cost-effective, non-hazardous long-term waste management plans. The Solid Waste Management Rules 2016 instructed Urban Local Bodies (ULBs) in India to investigate and analyse existing dumpsites to explore their potential for bio mining process of legacy waste. Microbes that feed on contaminants, changing them into small amounts of water or harmless gases like Carbon Dioxide and Ethene. It was first used on a large scale in 1972 to clean up Sun Oil pipeline spill in Ambler, Pennsylvania and since it has been used to remove pollutants from water bodies, groundwater, soil, etc. and restore them to their original state. The success of the bio mining process depends on the right selection criteria and performance criteria. Bio-mining is a process involving excavating previously dumped or disposed of material from waste dumping sites to recover plastic, metal, glass, cloths, combustibles, other fine material, and soil. Plastic, metals, and other reusable material thus recovered will be sent for re-cycling.

Keywords: Bio mining, Legacy Waste, Waste Management, Pollution Control, Dumpsite, Lechates



Production of Bio-Fertilizer by Using Agro Waste

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To be specific, the scientific questions that need to be answered urgently are whether agriculture could find smart and innovative solutions to redesign the use, management, and conservation of natural resources. The objective of this study was to develop a simple and cost-effective method to produce bio-fertilizer using agro-wastes. With the increasing demand in agricultural sector, it has become important to increase productivity by using various fertilizers. During this research work bio fertilizer was produced by composting mixtures of saw dust, sewage sludge and succulent tissue of green leaves. In this work, the mixtures of organic waste were composted at different weights at different temperature. Different parameters like composting time, dosage ratio and moisture content all significantly affects outcome and also changes will be occur in production in some period of time.

The effective of agricultural waste, which should be seen as an excellent opportunity to obtain valuable materials. For the same reasons, this review reports and discusses updated studies dealing with the utilization of agricultural waste, through its conversion into materials to be applied to crops and soil. This approach can decrease the impact of waste on the environment, allow the replacement and reduction in the use of synthetic fertilizer in agriculture, and facilitate the transition to a sustainable circular economy in agricultural field.

Keywords: Agro-Wastes, Bio-Fertilizer, Environmental Conservation.

Waste Water Treatment Study by Aeration Method

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Treatment of waste water before its disposal in to natural environment was not given importance until the recent past. This was due to increase pollution and contamination rates of surface and ground water sources by industrial effluent and urbanization. Waste water treatment is becoming more critical due to diminishing water resources and resulting water scarcity especially during summer. Aeration is one of the methods which help in the removal of various contaminants present in waste water. Aeration system have been developed during the past decade which will sustain fish and invertebrate biomass. Aeration is the process by which air is circulated through, mixed with or dissolved in a liquid or substance. Aeration brings water and air in close contact in order to remove dissolved gases and to oxidize dissolved metals, including iron, hydrogen sulfide, and volatile organic chemicals (VOCs). An evenly distributed oxygen supply in an aeration system is essential to effective wastewater treatment for fostering microbial growth. Dissolved oxygen is considered to be the most important water quality parameters in fish culture for supplying dissolved oxygen and removing contaminants we apply aerator in fish pond. Taking this consideration of fish pond (Aerator) for adding more amount of oxygen in waste water for decreasing contaminants we have to manually prepare and apply 'Inverted Umbrella Aerator'. This study represents a new manually designed aerator and show high performance for reducing pollution status of waste water. It may be benefitted practically at local level.

Keywords: Umbrella, Inverted, Dissolved Oxygen, Fish Culture, Biomass.



Removal of Heavy metals from the waste water using Bioadsorbent.

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Today purification of water is essential and to fulfil the water demand of the growing population and shrinking water resources. In last decades due to industrialization and overpopulations. The water quality is been degraded not only of surface water but also of ground water because of constant release of Industrial effluent directly to the water bodies without any primary treatment and over exploitation on ground water.

Heavy metals pose a significant threat to environment and public health because of their toxicity accumulation in the food chain and persistence in nature. Adsorption technology is one of the best water treatment technologies and has been used extensively for the uptake of toxic metal ions from ground, surface and wastewater. Rice husks, available as agriculture waste, are investigated as viable materials for treatment of Pb, Cd, Cu, and Zn containing industrial wastewater at controlled PH. Rice husk in removing some heavy metals at PH7.

However, Synthesis of on effective Environmentally and economically sustainable adsorbent is the centre focus of researchers these days. There are various adsorbents are being used yet for the removal of various water pollution.

Keywords: Waste Water, Heavy Metals, Bioadsorbent, Rice Husk.

Assessment of Groundwater recharge potentiality analysis using Frequency ratio (FR) models

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Groundwater plays vital role in human life being. Groundwater can be conserved for effective management, planning, and sustainable development of groundwater accessibility. The present study, an exertion has been made to assessment of groundwater potential zone using Frequency Ratio (FR) model using remote sensing and GIS techniques. Under this current study has used ten influencing thematic factors such as geology, geomorphology, soil texture, drainage density, groundwater drinking quality, groundwater fluctuation, rainfall, DEM, lineament, and slope were exploited for groundwater delineation. For the achieve result, groundwater potential zone index value is by the thematic layers were integrated into a GIS environment (ArcGIS 10.3) for groundwater potential zone demarcation. The groundwater potential (GWP) zone has been calculated for 137 villages and it has been categorized into four classes- i) Poor GWP ii) Moderate GWP iii) Good GWP iv) High GWP zone. Poor GWP Zone cover 19.01 sq.km of the total area and is observed in south eastern region of the study area. Moderate GWP Zone which is spread over 99.98 sq.km area is observed in southern part of the study area. Good GWP Zone extents



390.86 sq.km area and observed overall in the central region of the area. High GWP Zone contribute 78.48 sq.km area and found along the south western and central part of the study area. The present research reveals that the study area has good groundwater storage but most of this area is covered under the saline water zone.

Keywords: FR Model, GIS, Remote Sensing, Assessment, and GWP (Groundwater Potential Zone).

Environmental Changes - A Boosting Factor for Malignancy

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Air, water, climate, soil, natural vegetation and landforms are all environmental factors that affect everyday life, and play a key role in bringing health differences across the geographic areas. Looking at the current scenario it can be seen that the climatic changes are creating different havoc. With development our generations are getting prone to the various illicit and harmful drugs, chemicals released in the environment are also contributed a lot. Age, weight, exposure to carcinogens, and genetics can increase the risk of developing cancer.

In this review, we discuss the environmental changes and the changes thereof responsible for cancer.

Environmental changes are acting as boosting factor for malignancy and carcinoma. An urgent need is felt to convey the society that there may be a lot in your environment that we can't control, but if we gain knowledge about the environment, the more we can control and minimize the illicit factors.

Keywords: Boosting Factor, Environmental Changes, Malignancy, Carcinoma.

Evaluation of fungicidal activity of extracts of *Argemone Mexicana* against ginger infecting fungi

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Ginger is one of the commonly used plants as spices and in herbal medicines around the world. Globally the demand of ginger is very high. However, during germination stages the productivity of ginger is greatly affected because of fungal infections. These soft rot diseases caused by fungal agents reduce production of ginger nearly about 50%. The fungus that affects ginger before germination affects the yield significantly. Therefore, it becomes a necessity to find the sustainable strategies instead of synthetic chemical fungicides for the control soft rot. Dressing ginger with extracts of *Argemone mexicana* can achieve the control of fungal infection. In order to determine the efficacy of plant extracts against fungi, we studied in vitro



effect of leaves extract by agar based antifungal techniques. The ethanolic extracts significantly reduced growth of fungi followed by aqueous extracts. The fungi were isolated by selecting infected ginger from local market of Amravati. The plant used for preparation of extract was *Argemone Mexicana* collected from Melghat forest. The study would be helpful in increasing the productivity of ginger without adverse effects on soil microbiota by inhibiting the infection by fungi during germination stages of ginger.

Keywords: *Argemone mexicana*, Plant Extract, Soft Rot Disease, Inhibition.

Isolation, identification and antimicrobial susceptibility profile of extended spectrum Beta-lactamase producing *E. coli*.

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Extended spectrum beta-lactamase (ESBL) producing *Escherichia coli* has tremendously increased worldwide and it is one of the most common causes of morbidity and mortality associated with hospital-acquired infections. This could be attributed to association of multi drug resistance in ESBL producing isolate. The present study was aimed to determine the antimicrobial sensitivity profile of esbl producing *E. coli* isolates from urine sample. Current knowledge of prevalence of ESBL production by commonly isolated organisms such as *E. coli* is necessary action to prevent the spread. Therefore the present study was conducted with an objective to find out the prevalence of ESBL producing *E. coli* and its antimicrobial resistance profile to formulate effective antibiotic strategy and plan a proper hospital infection control strategy to prevent the spread of these strains.

Isolates of *E. coli* were collected from numerous urine samples from GMC Akola. Isolated microbial culture was subjected to antimicrobial sensitivity test (AST) by which the sensitivity of the organism was checked against antibiotics.

Then the *E. coli* isolates were tested against antibiotics which are specifically prescribed to ESBL infections by disc diffusion method. The zone of inhibition was observed, which indicates the presence of ESBL producing *E. coli*.

Keywords: ESBL, *E. coli*, ESBL producing *E. coli*, DDS.



Biogenic Synthesis and Characterization of Gold Nanoparticles using *Azadiracta indica* and its influence on viral enzyme activity

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Nano biotechnology centre works with diagnosing and fighting numerous virulence factors also with Human Immuno Deficiency Virus (HIV) that causes AIDS (Acquired Immune Deficiency Syndrome). For that it is essential to improve different pharmacological profiles of antiviral drug with more convenient drug administration. There are several advantages to using nanoparticles for therapeutics by considering effectiveness in lower concentration and potent antiviral activity against major viral pathogens. The synthesis of Gold Nanoparticles by using plant extract is rapid and simple method. The nanoparticles were successfully synthesized biologically by using (1mM HAuCl₄, Leaf extract, 0.1M NaOH). In this method the ruby red color indicates the formation of Gold nanoparticles. The characterization is carried out using UV-Visible spectrophotometer (UV-Vis) absorption peak observed at 529 nm which confirm synthesis of Gold Nanoparticle. Field Emission Scanning Electron Microscope (FE-SEM) reveals the presence of Gold nanoparticles in its agglomerated form. From the X-ray diffraction (XRD) pattern the average size of nanoparticle was estimated to be 154.8 nm. Fourier Transform Infra-Red (FT-IR) spectroscopic analysis shows absorption peak at 3364 nm. The various characteristics methods carried out, confirm the formation of (Au) gold nanoparticle. Gold nanoparticle shows the excellent inhibitory activity (82.98%) against the integrase enzyme of Human Immune Deficiency Virus.

Keywords: Gold Nanoparticles, *Azadiracta indica*, Biological Synthesis.

Lectin mediated recognition of target sites by Nanoparticles for the effective designing of Nanopesticides

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Nanotechnology has a very wide range of applications in agriculture. The size range of nanoparticles is between 1 to 100 nm. Nanoparticles are found to have growth enhancing effects as well as it protects the plant from harmful pests and other pathogenic agents like viruses, fungi and bacteria. The major loss of crop is due to the attack of insects and pests. Biologically synthesized nanoparticles (Copper and Zinc oxide) already reported to have bactericidal and fungicidal effects. These nanoparticles can be checked against certain group of sap sucking insects, such as Hemiptera, and to make it target specific, it can be conjugated with lectins so that it will recognize the specific cell surface receptors of a particular cell and there will be minimum effect on non-targeted insects and eco-friendly. In silico study of lectin fabricated nanoparticles gives more idea about its interaction with the specific targets. Lectins are the specific group of proteins which selectively recognize and binds to carbohydrates attached to the cell surface or soluble form with high affinity and specificity. Lectin binds to its recognition site through noncovalent interaction.



Lectins can bind to glycoprotein, complex glycan, N-acetylglucosamine, sialic acid, fucose, mannose etc. Lectin-mediated recognition is an interesting characteristic for the designing of novel lectin-conjugated nanoparticle-based insecticides and fungicides.

Keywords: Lectin, Nanoparticles, Insecticide, Carbohydrates, In-silico, Fungicide.

Effect of various utensils on sorghum fermentation in terms of lactic acid bacteria

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In vidharbha khandesh region different utensils used in traditional fermented food items, here we tried to identify which utensil is good for homemade Sorghum fermentation according to lactic acid bacterial population and its ecological association. The sorghum were soaked in water in 1:2 (w/v) proportions allowed to ferment. For colony count fermented inoculum pour on selective media. The lactic acid bacterial count in utensils higher in sequence clay > aluminum > steel > glass > brass > plastic. So that in homemade Sorghum fermentation clay utensil is good for homemade traditional fermented food items.

Keywords: Fermentation, Sorghum, Utensils.

Emergence of antibiotic resistance of *Micrococcus lylae* isolated from urinary catheter of a 50 year old women suffering from malignancy (First report)

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Urinary tract infection associated with the catheter (CAUTI) is the most common healthcare-associated infection that tends to cause an increase in the duration of morbidity and increased bacterial resistance to antibiotics. We aimed to review the incidence of bacteria, earlier not considered to be pathogenic but recently reported to caused pathogenic infection in 50-year-old women who had catheter-associated urinary tract infections and were bedridden. The bacterial cultures were isolated from urinary catheters and were well identified using standard microbiological techniques as well as by the Vitek 2 automated identification system. In Vitek, a Gram-positive culture was found with low discrimination between two closely related species which is *Micrococcus lylae* and *Micrococcus luteus* suggest a 50% chance of each bacterium. For precise identification, microbiological tests cited in Bergeys' manual as well as test mention in Vitek cards were done and confirmed *Micrococcus lylae*. Genotyping of bacterial species was confirmed using 16s rRNA sequencing and found to have 99% similarity with *Micrococcus lylae*. The sequence of 1400bp length has been submitted to NCBI and the accession number provided by them was MW356812. Subsequent studies on the antibiotic resistance genes (ARGs) have been determined by



sequencing showed that glycopeptides and macrolide resistance occurrence decreased, while the occurrence of ARGs associated with beta-lactam and aminoglycosides resistance increased.

Keywords: Vitek-2, CAUTI, *Micrococcus lylae*, *Micrococcus luteus*, ARGs.

Potential of Essential oil *Trachyspermum ammi* (Ajowan), its Antibacterial activity and Chemical constituents

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In present study the MDR pathogens Methicillin- resistant *Staphylococcus aureus* (MRSA) and *Escherichia coli* were isolated from the pus samples. The antibacterial activity of essential oil from *Trachyspermum ammi* (ajowan) was studied against these pathogens. Ajowan EO showed remarkable antibacterial activity against Methicillin-resistant *Staphylococcus aureus* (MRSA) with an inhibition zone diameter of 40 to 75 mm and followed by inhibition zone of diameter 20 to 28 mm against *E.coli*. The chemical components were identified by gas chromatography - mass spectrometry (GC-MS). A total of two chemical compounds were analyzed by GC-MS showing thymol (99.80%) as a major compound and carvacrol (0.20%) as a minor compound present in the ajowan essential oil. The ajowan EO exhibited potent antibacterial activity against Multidrug resistant (MDR) pathogens. Furthermore, the ajowan EO were more potent than standard antibiotics. This study suggests that spice essential oils have significant potential in controlling the MDR pathogens.

Keywords: MDR, GC-MS, *Trachyspermum ammi*, Antibacterial.



Prevalence of multi drug resistance and ESBL production in *Pseudomonas aeruginosa*

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Extended-spectrum beta lactamases (ESBL) are a group of plasmid-mediated, diverse, complex and rapidly evolving enzymes that are posing a major therapeutic challenge today in the treatment of hospitalized and community based patients. Infections due to ESBL producers range from uncomplicated urinary tract infections to life threatening sepsis.

To determine the prevalence and antibiotic sensitivity pattern of ESBL producing gram negative bacilli, a prospective study was conducted in the laboratory of department of Microbiology, Shri Shivaji Science College, Akola.

Isolates of *Pseudomonas aeruginosa* from different clinical samples were collected and processed following standard procedures. Each sample was then inoculated onto culture media. Identification, Antibiotic susceptibility testing, and extended spectrum beta lactamase production of the isolates were examined by disc diffusion method. The zone of inhibition was observed, which indicates the presence of ESBL producing *Pseudomonas aeruginosa*.

Keywords: ESBL, *Pseudomonas aeruginosa*, ESBL producing, DDT.

***Andrographis paniculata* and its Major Phytoconstituents Andrographolide as Potent Anti-HIV-Integrase Inhibitor**

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Andrographolide is major phytoconstituent of *Andrographis paniculata*, which is chemically a diterpenoid lactone ring. Andrographolide has shown antimalarial, anti-diabetic, cure for snake bite, anticancer and anti HIV properties. It is commonly used to prevention and treatment of common cold. Andrographolide prevent spread as well as transmission of virus to neighboring cells by interfering with different cell signaling pathways. The plant material under study was collected from Ghatang, Melghat forest. The leaves were cleaned, shade dried and grounded to get powder. The powdered material employed to aqueous, ethanolic and cold maceration method. Isolated extract of Andrographolide from *Andrographis paniculata* were separated using thin layer chromatography (TLC), Fourier Transform Infrared Spectroscopy (FTIR) and High performance liquid chromatography (HPLC). The aqueous extract of leaves of *Andrographis paniculata* are shown to exhibit 71.29%. Similarly the solvent extract of leaves of *Andrographis paniculata* showed 81.77% inhibitory activities against integrase enzyme of HIV. As natural products of *Andrographis paniculata* having the HIV integrase inhibitory property and their medicinal uses have been a part of some of disease control strategy.

Keywords: *Andrographis paniculata*, Andrographolide, HIV-integrase Inhibition.



Molecular marker a promising tool for individual identification of *Melursus ursinus* (sloth bear)

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Melursus ursinus (Sloth bear) is one of the endemic species found in India and Indian subcontinents. It is categorized as vulnerable as per IUCN and is protected under schedule I of wildlife protection act 1972. Habitat fragmentation and degradation has resulted in a severe decline of sloth bear population in the last 50 years. They cannot be identified individually with any phenotypic mark like tigers. Molecular markers are one of the promising tools that can help in individual identification of any species.

Cross species identification of 10 microsatellite markers were done on sloth bears. All the sequences were confirmed by Sanger sequencing. The markers were found to be heterozygous based on SDS PAGE analysis. This marker set can be developed as a panel specific for sloth bears for their individual identification and population study.

Keywords: Molecular Marker, *Melursus ursinus* (sloth bear), Endemic.



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