



ABSTRACTS & SOUVENIR

In Association



National Seminar on New Dimensions of Life Sciences in the Perspectives of Sustainable Development Goals

February 8 - 9, 2023



Organised by

**Mahatma Gandhi Chitrakoot
Gramodaya Vishwavidyalaya
Chitrakoot, Satna (MP)**





Dr. Anil Kothari
डॉ. अनिल कोठारी
Director General
महानिदेशक




Madhya Pradesh Council of Science & Technology
मध्यप्रदेश विज्ञान एवं प्रौद्योगिकी परिषद्
Vigyan Bhawan, Nehru Nagar, Bhopal-462003 (M.P.)
विज्ञान भवन, नेहरू नगर, भोपाल-462003 (म.प्र.)
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No. 2124 /CST/DG/2023
January 18, 2023

MESSAGE

I am extremely happy to know that Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot is organizing a “**National Seminar on New Dimensions of Life Sciences in the Perspectives of Sustainable Development Goals**” to be held during February 8-9, 2023.

I wish all the best for the successful organization of this National Conference at Chitrakoot.


(Dr. Anil Kothari)
Director General

Dr. Ramesh Chandra Tripathi,
Prof. of Zoology,
Department of Biological Sciences &
Research Director,
Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya,
Chitrakoot, Satna (MP) – 485 334.



महात्मा गाँधी चित्रकूट ग्रामोदय विश्वविद्यालय, चित्रकूट

MAHATMA GANDHI CHITRAKOOT GRAMODAYA VISHWAVIDYALAYA, CHITRAKOOT

District -Satna (M.P.) - 485 334, INDIA

(Established by the Govt. of Madhya Pradesh through legislature by Act No.09 of Year 1991)

Grade 'A' Accredited by 'NAAC'

Prof. Bharat Mishra
Vice- Chancellor



पत्रांक : वी.सी. / 2023 / 1990

दिनांक : 01.02.2023

MESSAGE

I am happy to learn that Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya Chitrakoot, Satna (M.P.) is organizing the National Seminar on 'New Dimensions of Life Sciences in the Perspective of Sustainable Development Goals' during 08-09 February 2023.

Really, it is most contemporary topic for this discourse, specially for the Scientists, Researcher and Post Graduate Students. As we know United Nations decided 17 SDGs which are an urgent call for action by developed and developing countries in the global perspective. They recognized SDGs 14th as life below water and 15th as life on land apart from this discussion, new dimensions of life sciences in the perspective of SDGs would certainly be awesome for the participants and gatherings during the seminar.

I'm very much sure that the galaxy of professors, stalwart scientists, delegates and participants will make this seminar meaningful and lead to the society for the upcoming challenges along with able to make infallible strategy for sustainable development.

For this, I extend my blessings to all success of the seminar.



(Bharat Mishra)

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पूर्वोत्तर पर्वतीय विश्वविद्यालय
NORTH-EASTERN HILL UNIVERSITY
A Central University Established under the Act of Parliament

Prof. R. C. Tripathi

Director Research

Mahatma Gandhi Gramodaya Vishwavidyalaya

Satna, M.P.

Dear Sir,

I take this privilege to express my sincere wishes for the **National Seminar on "New Dimensions of Life Sciences in the Perspectives of Sustainable Development Goals"** scheduled on **February 8-9, 2023** to be a grand success. I do hope that this Seminar will be a benefit to the participants and bring fruitful result.

Warm regards.

Prof. Prabha Shankar Shukla

Vice-Chancellor

NEHU, Shillong.

NATIONAL SEMINAR

on

"New Dimensions of Life Sciences in the Perspectives of Sustainable Development Goals"

February 8-9, 2023

Chief Patron

Prof. Bharat Mishra

Vice- Chancellor, MGCGV, Chitrakoot (M.P.)

Reception Committee

- **Prof. I P Tripathi** 9425884286
- Prof. Amarjeet Singh, Dean 9897980632
- Prof. D.P. Rai, Dean 9424356841
- Prof N. L. Mishra, Dean 8736985251
- Dr. Anjaney Pandey 9415896916
- Prof. S. K. Tripathi, DSW 9179336196
- Prof. Virendra Vyas, Director, DEC 9685999315
- Er. Rajesh Sinha, Principal, DDUK 9550223137
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- Dr. Sadhana Chaurasia 8085309800
- Apoorva Mishra 6264673932
- Aniruddh Prakash Pandey 7007213200

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- Shivani Tiwari 9407890608
- Gulabrani Kushwaha 8109269195
- Prakash Bharti 6265328708

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- Tarun Muarya 8130453391
- Sangram Singh 7470961544
- Satyarth Raguvanshi 9685956248

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- Yogendra Singh 7408470445
- Rajesh Pandey 9752374472
- Shri Vijay Singh 7389324710
- Vijay Tripathi 7651826951

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- **Dr. S. N. Ojha** 9425426353
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- Munni Lal Chaturvedi 9752166478

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- Dr. Abhay Verma 7054667966
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- Dr. Virendra Vays 9755289063
- Mr. Jai Prakash Shukla 9918085825
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- **Prof. S. K. Chaturvedi** 9450607094
- Manish Shukla 9336731807
- Atul Shukla 7389443532
- Sanjay Mishra 6394685846
- Guru Prakash Shukla 9981121575

Convener

Prof. Indra Prasad Tripathi

9685507386

Organising Secretary

Prof. Ramesh Chandra Tripathi

9450783615

Co-Convener

Dr. Ravindra Singh

9589270058

Co-Organising Secretary

Prof. Surya Kant Chaturvedi

9450607094

Mahatma Gandhi Chitrakoot Gramodaya Vishwavidhyalaya (MGCGV)

-At a Glance

Mahatma Gandhi Chitrakoot Gramodaya Vishwavidhyalaya (MGCGV), located on the bank of Holy River Mandakni near Sphatikshila at Chitrakoot was established on February 12, 1991 by social activist Padma Vibhushan Nanaji Deshmukh, by a separate MP Government Act (9, 1991). Named after Mahatma Gandhi, this university aims to provide higher education to people living in rural areas. It is a first rural university at Chitrakoot, India.

The broad vision of the University is to develop human resource for promoting activities related to socio-economic development of rural community and to improve quality of life of deprived masses through purposeful education in multidimensional field. The University has a mandate to evolve, promote and impart knowledge and skill to overcome the emerging challenges, create confidence among the rural community and make the use of recent advances in the field of higher education for spiritual and social transformation of rural people.

The message is embedded in the emblem of the University in the form of 'Padukas'. The motto of the University is 'विश्वं ग्रामे प्रतिष्ठितम्' i.e., the village is the universe in miniature. It also focuses on the problem solving action research and transferring the viable technologies to answer problems confronted by the rural majority.

In order to carry out its mandate, there are five faculties and within them are 18 departments and two independent entities- Distance Education Centre and Community College. Inter-disciplinary approach has been adopted for multidimensional growth of rural sector through advanced technology of teaching and learning. The University offers multidisciplinary higher education courses up to doctoral level in the disciplines of agriculture and animal sciences, applied sciences, environment, remote sensing and GIS, agricultural engineering, food technology, information technology, management, education, languages, communication, fine arts, humanities, social sciences etc. Those who are not able to attend regular classes due to economic or other service commitments, the University has established a good number of Distance Education Centers in the state of Madhya Pradesh for imparting higher education. Though the University is unitary in character, yet, the University has introduced Community College scheme to impart the skill oriented courses of different levels viz. Advanced Diploma, Diploma and Certificate programmes through 43 Gramodaya Community Colleges located in different areas of MP. The University has conceived various skill development courses after due consultation with the stakeholders and the same is made available to the community colleges to be adopted in the programmes run by them. Need based specific programmes are also introduced as per the regional demand of the community.

In order to promote skill education, the University has already introduced B.Voc. programme in nine streams on the guidelines suggested by National Skill Development council and further, it has also introduced BSW i.e. Bachelor Degree in Social Work (Community Leadership) for functionaries of state Govt. agencies for carrying out Govt. programmes.

Academic Programmes of the University

The University offers multidisciplinary higher education courses up to doctoral level in various disciplines. The academic activities of the University are spread over 14 Departments of 5 Faculties. These are:

Faculty of Agriculture - Department of Crop Science, Department of Natural Resource Management, Department of Technology Transfer.

Courses Offered: M.Sc.(Ag.) Extension, Soil Science, Agronomy, Genetics & Plant Breeding, Agriculture Economics, Horticulture (Vegetable Sc.), Agril. Biochemistry and Live Stock Production and Management. B.Sc. (Ag), B.Sc.(Home Science), **B.Voc.** (Agriculture Operation & Management), **M.Voc.** (Agriculture Operation & Management).

Faculty of Engineering and Technology -Department of Food Technology, Department of Agricultural Engineering, Department of Information Technology, Department of Civil Engineering.

Courses Offered: B.Tech. (Information Technology, Food Technology, Agricultural Engineering and Civil Engineering), Advance Diploma in Food Processing, Agricultural Operation and Management, B.Voc. & M.Voc. (Renewable Energy Management , Building Technology, Food Processing and Technology), D. Pharma (Ayurved).

Faculty of Rural Development and Business Management - Department of Rural Management, Department of Business Management, Department of Agri-Business Management.

Course Offered: B.Com., BBA, M.Com, Master of Tourism Management, M.A.(Rural Development), B.Voc. & M.Voc. (Bachelor of Vocation in Retail Management & IT).

Faculty of Arts - Department of peoples Education and Mass Communication, Department of Professional Arts, Department of Humanities and Social Sciences, Department of Sanskrit.

Course Offered: M.S.W., M.J.M.C(Mass Communication), MFA (Painting Applied Art, Sculpture), M.L.I.Sc., MA (Hindi, English, Sanskrit, Political Science, Philosophy, History, Sociology, Education, Math, Drawing and Painting, Applied Psychology, Yoga), M.Mus. (Tabala), MFA, B.Lib.I.Sc., B.J.M.C (Mass Communication), BA(Human Consciousness & Yogic Sc.), BFA (Painting, Applied Art, Sculpture), BPES (Bachelor of Physical Education Sport), B.Mus.(Bachelor of Music), B.S.W, Post Graduate Diploma (Yoga).

Major Research Dimensions-The University provides opportunities for higher education by research (M.Phil. and Ph.D.) in all streams indicated in the preceding sections. Selected areas of research are: **Rural Development, Science Agriculture, Engineering and Technology, Business Management, Humanities and Social Sciences.**

Faculty of Science and Environment

The Faculty of Science and Environment came in existence since the inception of the university (Chitrakoot Gramodaya Vishwavidyalaya, 1991). In the initial phase, department of Biological Science was started under the leadership of Prof. Prabha Grover. Later on, undergraduate courses with various subject combinations were started in July, 1992 under the leadership of Prof. A. L. Kirkire (as Dean).

Departments

- Department of Physical Sciences
- Department of Biological Sciences
- Department of Energy and Environment

Courses Offered: M.Sc. (Chemistry, Zoology, Botany, Biochemistry, Biotechnology, Industrial Chemistry, R.S. & G.I.S., Environmental Science, Information Technology, Physics, Applied Geology, Maths, Statistics), B.Sc.(Mathematics, Physics, Zoology, Botany, Biotechnology, Biochemistry, Environmental Science, Geology, Computer Science, Statistics and Information Technology), BCA, PGDCA, DCA.

The faculty member's specializations and their achievements are as follows:

Prof. Indra Prasad Tripathi is Dean, Faculty of Science and Environment, MGCGV, Chitrakoot Satna, MP India. He has made outstanding contribution towards research and re- standardization of traditional formulation of antidiabetic and antiseptic drugs using new techniques and methods. He has simultaneously made remarkable contributions towards the syntheses, characterization of metal complexes with their antidiabetic properties, antioxidant activities, superoxide dismutase mimicking activities, free radical scavenging activities, catalytic behavior etc. Prof. Tripathi has also worked on syntheses, characterization of carbon nanotubes. He made carbon nanotubes through metal complexes with natural proteins like spinach, egg albumins using various spectroscopic, diffraction/scattering, electrochemical characterization tools. His innovative contribution in the field of water, air and diffuse chemical pollution of Bundelkhand and Vindhyan Plateau of the country is appreciable. Prof. Tripathi has been invited as speaker and Chair of the Session in the 3rd International Conference on Chemistry for Sustainable Development: Indian Prospective, UAE, 3rd International Conference on Applied Sciences, Engineering and Technology, Nepal and 104th Indian Science Congress (Material Science Section) India. He has also organized 25 national level seminars and workshops and activities for rural masses, student's, research scholars and scientists. He has been honored with a number of awards viz. Professor R. D. Desai 80th Birthday Commemoration Award-2007, Research Board of Advisors, BIOVED Fellowship Award-2012, Best Science Research Award-2012 etc. He is currently Chief Editor, Editor and Editorial Board Member of many Research Journals. Prof. Tripathi has published 210 research papers and his Google Scholar citation-888, h index-15, i10 index-29 and Research gate value-25.12. Prof. Tripathi is a founder member of BER Chapter, NASI and actively engaged in the chapter activities.



Dr. Ramesh Chandra Tripathi joined this university in inception and has been working as Professor of Zoology. He is also working as Director Research in MGCGV Chitrakoot. Dr. Tripathi completed his higher education and D. Phil. degree from University of Allahabad. The areas of specialization are Biodiversity, Biological Control of Insect Pests, Biological Control of Mosquito larvae; GIS & human health. He has published 95 research papers in 20 reputed national and international journals. He also wrote a text book Biosystematics and Taxonomy in 2005, Emerging Trend of Research Dimensions 2022. He has been honored with the fellowship of Biocontrol Advancement, Bangalore, Zoological Society of India, Society of Life Science, GESA, Bioved Research Society. He has been conferred International Achievement 9th faculty branding award-2021, Life Time Achievement Award-2021, Best Scientist Award-2021, ABRF Excellence



Award for Zoological Research-2020, Dr. S.L. Mishra Medal, Prof. J.S. Munshi Gold Medal, Raghunathi Devi Medal and Young Scientist Award. He has supervised fourteen Ph. D. students. He has participated in more than 105 national and international symposium, seminar, and Training programme. Prof. Tripathi Google Scholar citation-195, h index-07, i10 index-05 and Research gate value-19.8. Prof. Tripathi is a founder member of BER Chapter, NASI.

Dr. Ghan Shyam Gupta is a Professor of Chemistry in the Department of Energy and Environment. He obtained M.Sc. (Chemistry) from Bundelkhand University, Jhanshi and Ph.D. (Chemistry- Applied Chemistry) from Banaras Hindu University, Varanasi. He has completed various research projects on surface and environmental Chemistry field funded by DST, UGC, CPCB etc. He has more than 90 research papers in his credit. He has got Sulabh International Award (II) and Best Science Research award (MPCST). He has also 25 years teaching & research experience. In extracurricular activities, he has got Colour & Championship (Athletics), BHU, Gold medal in SAARC Athletics competition.



Dr. Shashikant Tripathi is an Professor in Remote Sensing and GIS Division, Department of Energy and Environment. He is Post Graduate in Geology and Ph.D. in Economic Geology from Banaras Hindu University, Varanasi. He did P.G. Diploma in Environmental Geology from Indian Institute of Remote Sensing (IIRS), Dehradun. He has completed a pilot project from *Groupment pour de Development de la Teledetection Aerospatiale* (GDTA), Toulouse, France. He has also participated in various national and international symposia/seminar, and Training programmes. He has research experience of more than 30 years and teaching experience of 25 years. His area of research includes Hydrogeology and environmental geology. Twenty Ph.D. theses have been awarded under his supervision and guidance. More than 82 research papers have been published by him.



Dr. Surya Kant Chaturvedi is a Professor in Zoology. He completed his higher education from University of Allahabad. His area of specialization includes Wild Life Biology and Landscape Ecology, Bio Math and Bio acoustics. He has published more than 50 research papers and participated in many National and International Seminar/Conferences/ Workshop/Training. He has more than 30 years of research and teaching experience. He has been conferred Best Director Award in 2011, FZSI, FBRS, FGESA.



Dr. Ajay Kumar is an Associate Professor in Geology and Head, Department of Physical Sciences. He completed his higher education- M. Tech. (Applied Geology) and Ph. D. from Dr. Hari Singh Gaur University, Sagar (M.P.). His area of Specialization is Geochemistry and Environmental Geology. He has published more than 12 research papers. He has participated in 30 National and International Seminar/Conferences/



Workshop/Training. He has more than 30 years of research and teaching experience. Three Ph.D. theses were awarded under his supervision.

Dr. Vandana Pathak is an Associate Professor in Chemistry, Department of Physical Sciences. She completed her higher education from Dr. Hari Singh Gaur University, Sagar. Her area of Specialization is Analytical, Environmental and Plant Chemistry. She has published more than 40 research papers. She has participated in 20 National and International Seminar/Conferences/ Workshop/Training. She has more than 30 years of research and teaching experience. Six Ph.D. theses were awarded under her supervision.



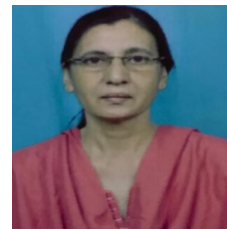
Dr. Virendra Upadhyay is an Associate Professor in Mathematics Dept. of Physical Sciences. His area of specialization is Bio-Mathematics. He completed his higher education from University of Allahabad. He has published more than 15 research papers. He has participated in 20 National and International Seminar/Conferences/ Workshop/Training. He has more than 30 years of research and teaching experience.



Dr. Ravindra Singh is an Associate Professor in Botany and Head, Department of Biological Sciences. His area of specialization includes Plant Physiology, Forest Ecosystem Management and Environmental Ecology. He has published more than 125 research papers and 08 books. He has participated in 38 National and International Seminar/Conferences/ Workshop/Training. He has more than 30 years of research and teaching experience. Twenty five Ph.D. theses have been awarded under his supervision and guidance. He got First Ranking in Research Publication in Indian Citation Index (2014).



Dr. Sadhana Chaurasia is an Associate Professor and Head, Department of Energy and Environment. Her area of research work includes Environmental Monitoring, EIA and Environmental Ecology. She has more than 135 research papers to her credit. She has 30 years of teaching & research experience. She has supervised fifteen Ph. D. students and participated in more than 50 national and international symposias, seminars, and Training programmes. She got Best Science Teacher Award in 2013 and Fourth Ranking in Research Publication in Indian Citation Index (2014).



Dr. Ravi Chaurey is an Associate Professor in Geology in the Department of Physical Sciences. His area of specialization is RS & GIS, Palaeontology and Hydrogeology. He has more than 20 research papers and 07 international symposium, seminar, and Training programme in his credit. He got 02 young scientist fellowships awards (FTYS Scheme of MPCST, Bhopal) and Best paper award in 3rd International Conference at Kathmandu, Nepal on Sept. 2014. He has also completed GWPMAP of (RGNDWM) NRSC, ISRO, Hyderabad and Mid Term Evaluation Project of Govt. of MP



completed project of Rewa, Chhatarpur, Damoh, Jabalpur Districts. He organized as a Member, International Field Workshop on the Vindhyan Super group Central India in 2010 with BSIP & Palaeontological Society of India, Lucknow. He also submitted project DPR of 23.50 Crore and Amay Env. Bhopal to Ministry of Pan. Raj & Rural Development and Jal Shakti Mantralay.

Dr. Anil Kumar Agrawal is an Associate Professor in Mathematics Dept. of Physical Sciences. His area of specialization is Theory of Relativity and Cosmology & Bio-Mathematics. He published more than 40 research papers and four books. He participated in 45 National and International Seminars/Conferences/ Workshops/ Trainings. He has more than 30 years of research and teaching experience. 12 Ph.D. thesis were awarded under his supervision.



Dr. S.S. Gautam is an Associate Professor in Statistics Department of Physical Sciences. He did Post Graduate and Ph.D. in Statistics from Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya, Chitrakoot, (M.P.). He got Young Scientist award in year 2012. He did "Rajeev Gandhi Jalgrahan Pravandhan Mission" from Rural Department of MP Government and "Bamboo Project" funded by NABARD, M.P. Besides this, he has participated in various national and international symposiums, seminars, and Training programmes. Many National Seminar and training programme have been organised by him. He has more than 30 years research and 25 years teaching experience. His main research interest is Experimental Design, Demography. Eight Ph.D. theses have awarded under his supervision and guidance. More than 75 research papers have been published by him.



Mission of Faculty of Science and Environment

The main missions of the faculty are-

- ❖ to promote learning and research generally in all branches of Sciences;
- ❖ to promote scientific knowledge and wisdom especially in the rural areas;
- ❖ to develop and promote the environmental awareness program in rural areas;
- ❖ to advance and diffuse scientific, technical and professional knowledge, combined with the necessary practical training to help in promoting indigenous industries and in developing the material resources of the country; and
- ❖ to promote the building up of character in youth by religion and ethics as an integral part of education.

Placement of the students

Most of the students have got job in government organizations, Multi National companies and some have developed their own business in the field of rural industries. Many national and multinational companies/ institution of repute like LUPIN, Ramdev Chemicals, ROLTA, SGS, RSI, etc., have providing opportunities

to our students. Some students are in job in China, Malaysia, Thailand, Philippines and other countries.

Outstanding Achievements

Faculty have completed/ participated in state, national and international level projects of many departments and organizations like UGC, DST, New Delhi, MPCST- Bhopal, ISRO, IWDP, NABARD, Ministry of Environment and Forest New Delhi, Central Pollution Control Board and District level projects etc.

Sophisticated Instruments and software of the Faculty

A00 –Scanner, A00-Plotter, High Speed Server, Arc Info Software, ENVI, IDLE, PCI Geomatica, ILWIS, with 20 computer with internet facility, Video Conferencing System, Hand Held GPS, Autolab potentiostat for working ± 10 volt. NOVA software, spectro-electro chemistry compatible, fiber optic spectrophotometer, FTIR, Micro Plate Multimode Detection Reader, AAS, UV – visible Spectrophotometer, HPLC, Gas Chromatography, Ion selected Electrode, Flame Photometer, Spectrophotometers, Laminar Air Flow, Stack Monitoring Kit, Meteorological station, RDS, HVS, Ion selected Electrode, Compound Microscope, Electro phoresis, Environmental chamber, Trinocular Research Microscope, Stereoscopic binocular microscope, Universal Microscope, Surveying instruments, Models, Sieve Analyzer , Petrological Microscope, etc.

Future Thrust

The Chemistry division of Physical Science department has been conducting research in the frontier areas of subject like Organometallic Chemistry, Biosensor, medicinal Chemistry and Environmental Chemistry. Mathematics division has worked on Biomathematics, advanced statistics, statistical based modeling. The Remote Sensing & GIS and Geology division have conducting research in the frontier areas of subject like– digital image interpretation, GIS, Geohydrology, mineral exploration and geostatistical modeling. Department of Energy and Environment have decided to work on the thrust area like– EIA, monitoring and management of natural resources, satellite based climatic studies, Surface chemistry of adsorbents etc. The Department of Biological Sciences has been conducting research in the frontier areas of subject like Biosensor, Biotechnology, Ethnobotany, Wild life habitat analysis, EIA, Human Health, Biological control of insect pest, Biodiversity management, and Biosystematics.

ABOUT THE NATIONAL ACADEMY OF SCIENCES INDIA (NASI).....

The National Academy of Sciences, India, the oldest Science Academy of India with the largest pool of distinguished academics, researchers, scientists and technologists, over and above its role in terms of nurturing and leveraging an eminent peer group to address relevant policy issues and nurturing application oriented research and innovation, distinguishes itself in terms of its Science & Society programmes. The ‘Science Education /Communication

programmes' are being organized by NASI along with its 21 Chapters spread in throughout the country.

NASI-Bundelkhand Extended Region (BER) Chapter, with its founder chairman, Prof. K.B. Pandeya, Former Vice Chancellor, Mahatma Gandhi Chitrakoot Gramodya Vishwavidalya Chitrakoot was inaugurated on December 9, 2011 at MGCVV, Chitrakoot (M.P.). The chapter, since its inception has successfully organized various activities of science popularization that include popular lectures, workshops and seminars etc. in different schools, colleges and universities of different places/cities of Bundelkhand extended region e.g. Rewa, Sagar, Gwalior, Chhatarpur, Bhopal, Indore, Chitrakoot, Tikamgarh, Satna, Maihar, Katni, Narsingpur, Khajuraho etc. More than fifteen programmes (including International conference, National seminar/ symposium/workshop/ extension popular lectures/ awareness programmes) are organized every year with a focus on the rural mass connectivity with science in collaboration with M.P. Council of Science & Technology, Bhopal; M.P. Pollution Control Board regional office Satna; Mahatma Gandhi Chitrakoot Gramodya Vishwavidalya Chitrakoot; Deendayal Research Institute Chitrakoot and other academic bodies.

ABOUT SOCIETY OF LIFE SCIENCES

The Society of Life Sciences (SLS) was established in 2004. It is the registered society open to everyone, who has an interest in the field of the Life Sciences. The Society provides a forum for the publication of basic and applied researches in Life Sciences in the field of Animal Science, Plant Science, Microbiology, Biotechnology, Environment and Medical Science. Society is regularly publishing two peer reviewed biannual journals *i.e.* National Journal of Life Sciences and Life Science Bulletin from 2004. The on line version is also available at www.slsjournals.com. The Society awarded Citation, Medals and encouragement awards to research students, senior and young scientists to encourage their best presentation throughout the country in more than thirty institutions. The Society has given Fellowship (FSLSc) to its selected life members in every year after the evaluation of their contribution. Not only this, the excellence in such areas recognized by Society, by giving them awards for reputed Senior Scientist awards in the memory of doyens of Life Sciences. The society conferred also SLS Recognition Award, SLS Best Scientist Award and Life time Achievement Award (for senior/retired academicians), who are actively engaged in the service of Life sciences.

SOCIETY OF LIFE SCIENCES

National Seminar

"New dimensions of Life Sciences in the perspectives of sustainable development goals"

February 8-9, 2023

**Mahatma Gandhi Chitrakoot Gramodaya Vishwavidyalaya
Chitrakoot (M.P).**

Felicitations on 08-02-2023 at Chitrakoot (M.P)

• SLS Life Time Achievement Award 2023	
Prof. Bharat Sharan Singh Chairman Madhya Pradesh Private University Regulatory Commission, Bhopal (M.P.) Mobile: 9425184138 e-mail: chairman.mppurc@mp.gov.in	
Dr.G.S. Solanki Former Dean School of Life Sciences and Head, Department of Zoology Mizoram University, Tanhril campus, Aizawl, Mizoram Mobile: 8259969886 e-mail: drghanshyam.solanki@gmail.com	
Dr. Devendra Kumar Soni Regional Director, Central Pollution Control Board, (Ministry of Environment Forest and Climate Change) Regional Directorate, Lucknow (U.P.) Mobile: 09794996946 e-mail: drdevendrakumarsoni@gmail.com	
Prof Ramesh Chandra Tripathi Professor of Zoology Department of Biological Sciences and Director Research Mahatma Gandhi Chitrakoot Gramoday Vishwavidyalaya Chitrakoot, Satna (M.P) Mobile: 9450783615 Email rctmkgcv@gmail.com	
Prof. G.B. Shinde Award	
Prof. Ajit Tukaram Kalse Professor and Head, PG Dept. of Zoology, Nanasaheb Y. N. Chavan ASC College, Chalisgaon, Dist. Jalgaon, (M.S.) Mobile: 8888519119 e-mail: charuajit@gmail.com	
• SLS Best Scientist Award 2023	

<p>Dr. Rama Kant Associate Professor, Department of Botany Ch.Charan Singh University Meerut (U.P.) Mobile: +91 9436541335 e-mail: rkojha_1@rediffmail.com</p>	
<p>SLS Recognition Award 2023</p>	
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The Host City, Chitrakoot

Chitrakoot, is a town and a nagar panchayat in the Satna district in the state of Madhya Pradesh, India, nestled in Bundelkhand region of India, is a charismatic land of cultural, spiritual and historical significance to the folks traveling from every nook and corner of the world. It is a town where the past is pleasingly treasured in its colorful divine centers, while the serene rivers, peaceful woods and miraculous sights together make it a highly visited place in Madhya Pradesh, India. An illustrious place of superb fairy-tale significance, Chitrakoot imitates the quintessence of Hindu lifestyle. Fiestas and fairs in this holy town have a spiritual façade and it is geared up to eulogize the charm of Lord Rama with its different fairs. It is a town of religious, cultural, historical and archaeological importance, situated in the Bundelkhand region. It borders the Chitrakoot district in Uttar Pradesh, whose headquarters Chitrakoot Dham (Karwi) is located nearby. The town lies in the historical Chitrakoot region, which is divided between the present-day Indian states of Madhya Pradesh and Uttar Pradesh. It is known for a number of temples and sites mentioned in Hindu scriptures. It was in these deep forests that Ram, Sita and his brother Lakshman spent a few months of their fourteen years of banishment ; the great sage Atri, Sati Anusuya, Dattatreya, Maharshi Markandeya, Valmiki and various other sages, seers, devotees and thinkers meditated; and here the principal trinity of the Hindu pantheon, Brahma, Vishnu and Shiva, took their incarnations.

It is said that all the gods and goddesses came to Chitrakoot when Rama performed the Shraddha ceremony of his father to partake of the shuddhi (i.e. a feast given to all the relatives and friends on the thirteenth day of the death in the family). The first known mention of the place is in the Valmiki Ramayan, which is believed to be the first ever Mahakavya composed by the first ever poet. As Valmiki is said to be contemporaneous with (or even earlier than) Ram and is believed to have composed the Ramayan before the birth of Ram, the antiquity of its fame can well be gauged.

Many people gather here on each Amavasya. Somwati Amavasyas, Deepawali, Sharad- Poornima, Makar Sankranti and Ramanavami are special occasions for such gatherings and celebrations. It attracts crowds throughout the year including above occasions and for Free Eye Hospital Camps. Noted 'Ayurvedic' and 'Yoga' centres like 'Arogyadham' are located in Chitrakoot.

Abstracts

Integrated Carp Polyculture for Sustainable Development

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Aquaculture is a fast growing food-production sector that recently overtook fisheries as the main source of fish for human consumption. However, aquaculture is often associated with decreased environmental quality and has severe impacts on natural ecosystems. It is essential to improve the farming systems for environmental sustainability. Sustainable aquaculture development must be advanced in a manner that is environmentally sustainable and that protects the quality of the environment for other users, while it is equally important for society to protect the quality of the environment for integrated aquaculture. Integrated carp polyculture is a developmental characteristic of aquaculture in water and is a typical farming system which is characterized by waste recycling, energy saving, resource utilization and integration of ecological niche. In Nepal different aquatic systems represent a total of 252 fish species. Among them 236 species are indigenous while 16 species are exotic. These species belong to 15 orders, 40 families and 120 genera. Carps of the order Cypriniformes are the major fishes cultivated in Nepal. These includes Indian Major Carps; Rohu (*Labeo rohita*), Mrigal (*Cirrhina mrigala*), and Chinese Major carps; Grass carp (*Ctenopharyngodon idella*), Silver carp (*Hypophthalmichthys molitrix*) and Bighead carp (*Hypophthalmichthys nobilis*). Two varieties of Common carp; Scale carp (*Cyprinus carpio* var. *communis*) and Mirror carp (*Cyprinus carpio* var. *specularis*) are cultivated also. These indigenous and exotic carp are important in several respects of polyculture which makes a complete use of three dimensional growing space by the entire water column ultimately resulting in higher yield. Annual fish production of Nepal is 104623 metric tons with the contribution of 83623 metric tons from aquaculture and 21000 metric tons from the inland capture fisheries, indicating per capita fish production 3.43 kg only. Moreover, aquaculture diversification and commercialization have drawn attention of the planner and policy makers in terms of generating more income and employment opportunities towards sustainable development of the nation. Endocrine Disrupting Chemicals: An Emerging Threat to Aquaculture and Sustainable Environment.

Strengthen Bio economy: Sea Vegetables; Nori (Laver) - New Health and Functional Ingredient: The inside happening- Taurine factor

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Human ecology is a part of integrated ecosystem which is composite in nature having plants, animals, and other organisms as well as weather and landscapes, connected with an inner circuit to form a bubble of life. With increased human population, stress in equilibrium is logical and people have overtaken many ecosystems. As the ecosystem shrunk fewer bison could survive thus search of new alternative is a question? there may be several answers but one of the available can be identified through utilizing bio resources supporting the concept of bio economy. The bio economy, or bio-based economy, is a new model for industry and the economy. It involves using renewable biological resources sustainably to produce food, energy, and industrial goods. The most notable use of bio economics and modelling is looking at the marine life. A nation's growth is now also linked with growth in bio economy. Looking at India's bio economy in 2021 a 14% increase is observed over past year with \$80 billion. Bophirima still accounts for the largest share of the Bio economy with 49% amounting \$39 billion. Next comes bio industries amounting \$10 billion, bio Agri share is also increasing from Bt cotton to marine biotech. One of the rapid bio economy sectors is alternate food or smart proteins. India is a preferred destination for both innovation and manufacture in the smart protein area. India's bio economy has been targeted to \$ 150 billion in 2025 and \$270 in 2030.

To accelerate the process of bio economy marine life provides a reservoir of sources one of them is various weeds found in sea. Sea vegetables (Seaweeds) have been part of human diet of oriental people since ancient time. The recorded evidence reveals its presence even in Jomon-Pattern era (BC 300-6000) however it is Yamato dynasty in Japan, during the 4th century; started to collect it as tax. The word Nori is Japanese term which is also called Laver in English literature. Nori is also associated with religious rituals and offered to the spirits of ancestors. The original Nori was formed as a paste. Currently it is generally in sheet (paper) form which was invented in Kido period. Traditionally it is a part of diet of Chinese, Korean, Japanese, and other oriental countries with believe that it protects them to stay away from various ailments and is vital for longevity and good health. Its food benefits are so high that today it has crossed boundaries to reach all the continents. Taxonomically it belongs to genera porphyria with about 50 species of which half of them found in Japan itself. Through biology of porphyria is complicated but now it is well understood. The wide acceptability of Nori is due to its taste and health benefits. Nori contains almost all essential molecules for sound health, from minerals to protein, fatty acid to amino acids. It also contains vitamins A, B1, B2, B3, B6, B12, C, E, and the fighting nucleotides to valuable fibres.

The use of this weed as component of food is consequence of its valuable health benefits. Literature has ample supporting evidence; for lowering of blood cholesterol levels, anti coagulant, anti cancer with lowering rate of breast cancer, prevention of the occurrence of gallstone, prevention of gastric shay ulcer, intestinal carcinogenesis, anti-inflammatory, anti oxidant, fat liver infiltration, anti allergy, reducing arsenic toxicity as well as promoter of hair growth, eyesight to increase life span. The increasing health benefits have increased the number of consumers several fold. Today, besides its utility in making sushi and rice balls; it is boiled as vegetable, drinks as part of soup stocks. Seasoning for rice dishes, part of snacks, it is also used as raw making for jam and wine and sold as nori jam, nori wine. It is also used to wrap up all kinds of raw pate's, sprouts, fermenting food (like sauerkraut) or any vegetable sushi combination, mixing with salad, miso soup. For vegetarian, sushi roll is used having nuts and seeds as an alternative to fishes or seeds and cheeses wrapped up a cooked avocado and cucumber. Kids love it in a great way for them; to get such mineral rich nutrient from a wonderful ocean vegetable is a mixture of taste and health.

All these beneficial actions of Nori seems to be because of the molecules present in it; while going through its various chemical component, besides others, the presence of large number of bound and free amino acids are surprising events and is believe to be responsible for taste, texture and flavour. The presence of very high amount of sulphur amino acid; taurine, the highest among the free amino acid found, is a matter of thought, as such a huge amount must have marked utility. In fact, what's ever the nori showed its functionality, taurine also has; and it is quite possible that nori beneficial activities may be monitor through taurine.

Taurine, chemically; 2- Amino ethane sulfonic acid is endogenous substance in human body with about 0.1% but its concentration decline with ageing hence external supplementation is essential. Taurine is now regarded as functional agent and has been patented, for various disease prevention, for brain to heart, eye to lever, and diabetic to bone loss. It is also promoter of well being, hair growth and is part of longevity agents like Nori. It seems that Nori beneficial properties are because of presence of high amount of taurine. Nori sheet and its products for food, snack, and other preparation are getting big momentum, and increasingly becoming billion-dollar business. To accelerate momentum, it invites special attention towards its production, invention of its therapeutic potential & functional molecular linkage with taurine for better understanding of its action mechanism; superiority as well as increasing the profits.

Globally seaweed production is currently \$12-15 billion and expected to grow 26 billion by 2025. At present China and Indonesia have 80% share. Future of the seaweed production in India is very bright and country is aiming several fold increases in production in next five years to 11.5 lakh tons, this can be achieved by using just 1% of its 8000-Kilometer-long coastline itself.

Agnihotra and Homa Organic Farming - Tools for a Sustainable Development on Planet Earth

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The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity.

In this presentation I want to concentrate on the first three goals:

- ◆ NoPoverty
- ◆ Zero Hunger
- ◆ Good Health and Well-Being

But as these goals are interconnected, working towards these three goals also will have an effect on the other Sustainable Development Goals. For that, two problems have to be solved.

First, a growing number of people have to be fed and the available land cannot be increased

Second are Environmental Pollution and Climate Change. All live on this planet – plant kingdom, animal kingdom, and humans – are affected, and present day farming systems contribute to these problems:

Conventional agrochemical agriculture is not been sustainable. It has led to a degradation of soil, pollution of not only soil but also water resources and our atmosphere. This makes it clear that we cannot continue like that – alternative ways of farming are the need of the hour.

We have to change our lifestyles and find sustainable ways in order to basically save our planet. But Farming is just one source of environmental pollution. Industrial waste, household waste, pollution by combustion engines (especially cars and trucks) etc. have created a compound of pollution which now causes problems in yield and health of plants, and leads to diseases of animals and humans.

What can be the solution for this universal problem?

One such solution is Homa Therapy with Agnihotra, a daily pyramid fire at sunrise and sunset, as its basic tool. It comes from ancient Vedic Knowledge and has wide-reaching beneficial effects on our whole environment, means on our atmosphere, on the soil, and on our water resources, and also biodiversity is increased. Agnihotra purifies our environment

and thus offers a solution for a sustainable future where humans live in Harmony with Nature, with plants and animals and keep this planet, our Mother Earth, alive and thriving.

In this presentation first the method of Agnihotra and Homa Therapy will be explained.

Then I will give an overview on the research done so far and the research currently being carried out about how Agnihotra and Agnihotra Ash help to mitigate problems of the pollution of our atmosphere, the soil, and water resources and thus lead to sustainable agriculture and horticulture.

Also the prevailing paradigm of NPK will be discussed and it will be shown that it has no relevance for organic farming. Besides, that Homa Organic Farming can help a lot to sequester large quantities of CO₂ from the atmosphere which helps in controlling Climate Change. Often there is the apprehension that when we move away from agrochemical farming, yields will go down – so farmers will have difficulties to sustain their families, and it will also not be possible to feed the growing population. Both fears will be shown to be unfounded. With Homa Organic Farming yields are increased, and Homa Farming is more profitable than conventional farming. This also is an important example of how we can bring ecology and economy together for a sustainable future.

Biodiversity of Capingentidae Tapeworm parasites from district Jhansi (U.P.) India

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ABSTRACT

Jhansi is one of the important historic district of Uttar Pradesh, we visited, Betwa river and collected the local fish with the help of fisherman. After thoroughly examination we found that one of the *Heteropneustes fossilis* (Bloch) yielded two moving parasites in its intestine. These parasites were unsegmented tapeworms which were preserved in 5% formalin in the laboratory these parasites were thoroughly washed, stained, mounted and ultimately identified as new member of the family Capingentidae Hunter, 1930.

Biodiversity of Cestode and Nematode in Girna Dam Fishes

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Biodiversity is a measure of variation at the genetic, species, and ecosystem level. Parasitic worms are usually parasitic at the adult stage, but many are also parasitic as larvae. The classification and identification of parasitic worms have been based mainly on morphological features, other factors, such as the host, distribution, site and life-cycle, may also be taken into consideration. In recent years, classifications based on molecular findings, which are thought to approximate closer to a true phylogenetic system, have been introduced. The Cestode and nematodes are found in the intestine of vertebrates. These are vary in size from just a few millimetres to many metres in length. There are marked differences in the form of the attachment organ on the scolex, which form the main criteria for distinguishing the numerous orders of the group. Roughly one in ten parasitic worms has been described by taxonomists, while the majority of species remain unknown to science. Parasites are rarely discussed probably because it tends to be hidden within their hosts—and therefore easy to ignore. Parasites have fundamental effects on ecosystem function; important ecological role played by parasites is regulating host community structure and biodiversity.

The objective of the present study was to study the biodiversity of Cestode and nematode in fresh water fishes of Girna dam. A total of 500 fishes were examined, in which 249 fishes (49.8 %) were infected with 228 cestode parasites and 172 nematode parasites, which belongs to four and seven genera respectively. The result of the present study suggest that cestodes mainly *Circumoncobothrium* spp., *Senga* spp., *Lytocetus* spp., *Polygoncobothrium* spp., and nematodes mainly *Eustrongylides* spp., *Rhabdochona* spp., *Syphaciella* spp., *Contracaecum* spp., *Ascardia* spp., *Camallanus* spp. and *Trichuris* spp. are the main intestinal parasites of girna dam fishes (viz. *Mastacembellus armatus*, *Wallago attu*, *Ophiocephalus punctatu*, and *Clarius batrachus*). This report summarizes the data of incidence, intensity, density and index of infection in fresh water fishes in relation to environmental factors. Incidence of infection was higher in winter season. While intensity of infection was higher in Monsoon and density of infection was higher in winter season. The present study will be helpful to the status of diversity of Cestode and nematode parasites from Girna dam.

Key words: Biodiversity, Cestode, Nematodes, Girna dam, biodiversity.

The Antiretrovirals induced mutations, drug resistance and strategies to combat challenges in chemotherapy of AIDS

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WHO have reported that 35.3 million people were living with human immunodeficiency virus type 1 (HIV-1) infection (PLWH) or acquired immunodeficiency disease syndrome (AIDS) globally at the end of 2012, which included about 0.8% of adults aged 15-49 years. National AIDS Control Organization (NACO) of India has shown the prevalence of AIDS in the country in 2013 to be 0.27 million. Over the past decade, the world has witnessed an unprecedented increase in the use of antiretroviral therapy (ART), which has saved the lives of tens of millions of people living with HIV/AIDS. At the end of 2021, 28.7 million people, out of an estimated 38.4 million people living with HIV, were receiving ART globally. HIV drug resistance can compromise the effectiveness of antiretroviral drugs in reducing HIV incidence and HIV-associated morbidity and mortality. Though the application of highly active antiretroviral therapy (HAART) worldwide has been able to significantly reduce the rate of mortality and morbidity of HIV-1 infected individuals, all antiretroviral drugs, including those from newer drug classes, are at risk of becoming partially or fully inactive due to the emergence of drug-resistant virus. If not prevented, HIV drug resistance can jeopardize the efficacy of medicines used to treat HIV, resulting in increased numbers of HIV infections and HIV-associated morbidity and mortality. The appearance of clinical drug resistance in AIDS patients due to various factors including non adherence to medication (intake of antiretroviral) has been found to be associated to chemotherapeutic and virologic failure. In addition, high rate of viral replication, infidelity in proviral cDNA synthesis, appearance of heterogenous circulating viral quasi-species as well as immunological and pharmacological factors also contribute to the development of drug resistance. The present research paper describes our understanding on the underlying mechanisms of drug resistance in HIV-1 against the second generation antiretrovirals and possible strategies to encounter the challenges in chemotherapy. Some results from our *in vitro* studies involving molecular approaches to display role of certain amino acid residues in the wild type and mutant variants of HIV-1 RT in imparting drug sensitivity or resistance have been discussed. The recent endeavors to explore new targets for specific actions of the antiretrovirals in order to develop target-structure based new small molecules with least toxicity would also be discussed.

Endocrine Disrupting Chemicals: An Emerging, threat to Aquaculture and Sustainable Environment

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Recently, it has been reported worldwide that endocrine disrupting chemicals (EDCs) are one of the most important emerging contaminants which has been accumulated in the aquatic environment and aquaculture sector at detrimental amount. Many of these chemicals are either natural or synthetic and contribute to humans day to day life. Over the past 25-30 years, exposure to anthropogenic chemicals which mimic with hormone and its receptor and have been shown to interfere with non-genomic (non-classical) and genomic pathways. Recently our laboratory has conducted an extensive study with heavy metals, chlorophenols and alkylphenols on the catfish *Heteropneustes fossilis* (which is an economically important aquaculture species). Our investigation concluded that EDCs differentially affected male or female reproductive physiology via inhibition of steroidogenesis pathway, development of intersex gonads, alteration of the gonadosomatic and hepatosomatic index, decreased fertility, developmental toxicity, negative impact on oocyte growth and maturation.

E-flows, Fish Diversity and Small Scale Fisheries in Nepal

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Environmental flows (e-flows) in rivers have direct association with fish diversity, ecosystem, fisheries, and livelihood. The concept of e-flows is related with quality, quantity and seasonality of river water flow for maintaining resilience to aquatic ecosystems for livelihood. E-flows may not be a stagnant value, but comprised of a series of standards that emit natural flow according to the seasons. However, the E-flow is not the natural flow of river instead the terms reveal a balance between benefiting ecology and humans. To find out the possible interrelationships between the e-flows, fish biodiversity, water quality, livelihood, we reviewed published literatures. The result showed that there is increasing threat on fish diversity in Nepal due to several problems of river fragmentation and anthropogenic activities for hydropower generation, infrastructure development in remote areas, population growth and climate change etc. E-flows might be associated with dissolved oxygen, macrophytes, nutrients, dominance of fish species diversity. As different fish species has its own social, ecological and economical values. Thus, certainly viability of small-scale fisheries and livelihood are tied up. We argue that for sustainable small scale fisheries 'presumptive flow standard' of e-flows should be applied for ensuring sustainable fisheries and livelihood.

Key Words: Ecosystem services, hydropower, small-scale inland fisheries, aquatic habitats

Present Status of Fish Diversity of Dah Lake, Ballia (Eastern Uttar Pradesh) for Conservation and Sustainable Production

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Regular surveys of Dah Tal (Ballia) were conducted during April 2014 to March 2016 to record fish diversity of the lake for conservation and sustainable utilization. The lake is located on Bansdih-Maniar Road at about 26 km from Ballia district of eastern Uttar Pradesh. Fishermen of about 16 villages are involved in fishing activities in the Tal with Halpur being the main village. Fishes are caught in gill-net, dragnet Kuliajal *etc.* Capture fishery of the Tal is dominated by Cypriniformes (36%) of which the Indian major carps comprising 15-20% and minor carps 5-8%. Catfish and feather backs constitute 35-40%, live fish 5-10% and forage fish 15-20%. Fish catch dominated by *Catlacatla*, *Labeorohita*, *L. calbasu*, *Cirrhinus mrigala*, *Sperataseenghala*, *M. vittatus*, *Channa punctatus*, *C. marulius*, *C. striatus*, *C. gachua*, *Puntius ticto*, *P. sarana*, *Oxygaster bacaila*, *Chandaranga*, *Mastacembalus puncalus*, *Colisafaciatus*, *Xinantodon cancila*, *Heteropneustes fossilis*, *Clarias batrachus*, *Pseudotropius atherinoides*, *Amphipnoscuchia Wallago attu*, *Pangasius* spp. and *Bagarius bagarius*.

Biotic Communities comprise phytoplankton (72.51-73.19%) 73 species from Chlorophyceae, Cynophyceae, Bacillariophyceae and Dianophyceae, Zoolplankton (26.61-27.45%) 26 species from Rotifera, Copepoda, Cladocera and Protozoa. Water insects consisted of 5 species- *Avedus*, water spider, water scorpion and *Belostoma* were observed. Macrophytes belonging to 26 species were observed. Major portion of the lake is choked with hyacinth (*Eichornia crassipes*) and *Chara* spp. Physico-chemical parameters of the water were recorded as pH 7.80-8.47, dissolved oxygen 6.2-6.9 ppm, conductivity of water 303.5-336.2 $\mu\text{S}/\text{cm}$ (25.8-32.4⁰C) and RDO 26.7-28.8 (25.8-32.4⁰C). This lake gets connected rarely with river Ganga during very high floods. Fishes are sold afresh in markets of Halpur and Ghongha Chatti and some are transported to Ballia too. Though, the lake appears to be very productive and well-connected by road but poorly managed and under-utilized.

In vitro evaluation of Antioxidant and Hyperglycemic activity of *Tamarindus indica*

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Plants are very useful source of various bioactive components which have direct or indirect use in the treatment of various human ailments. The history of medicinal plants use for treating diseases and ailments is probably dates back to the beginning of human civilization. The present research work documented the in vitro antioxidant activity (DPPH, ABTS) hyperglycemic activity (alpha glucosidase and alpha amylase) of *Tamarindus Indica* (Imali). The study revealed *T. Indica* stem bark show highest antioxidant activity.

Key words: antioxidant activity, hyperglycemic activity.

Role of Aquaculture strengthening food security and fish nutrition in Bangladesh

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Large numbers of people in the South Asian Association for Regional Cooperation (SAARC) region suffer from hunger and malnutrition, with recent estimates indicating that 14.90 percent of the people suffer from hunger and malnutrition. Strategies of Sustainable Development are required to achieve the Sustainable Development Goal (SDG2) of eliminating hunger and malnutrition by 2030. Bangladesh is one of the leading aquaculture productions worldwide. The total production of fish was over 4.621mil.mt in the year 2020-21 which contributes 3.52% to the national GDP, 26.37% to the agricultural GDP and 1.35% to the total export earnings. Fish alone supply a per capita consumption of 62.58 g/day in daily dietary requirements. About 12% people lead their livelihood directly or indirectly in the fisheries and aquaculture sector. Fish is a good source of protein, micro-nutrients, and essential fatty acids. Fish plays a vital role to control malnutrition problems by supporting food security, basic health services, and maternal and child care. The assurance of comprehensive food security is associated with the complete production chain starting from the induced breeding to the production of different fish species to apply sustainable technologies at the farmer level. Sustainable aquaculture and fisheries management technologies are very important to support food security and nutrition of daily dietary demand for increasing population. Proper dissemination, adoption and utilization of available research based technologies, transfer of knowledge and information tools by training could enhance food safety from the primary production sources to the consumers' levels in the South Asian Association for Regional Cooperation (SAARC) region.

Keywords: Aquaculture, Fisheries management, Food security, Nutrition.

Some Reproductive Strategies of Monogeneans: Indian Perspective

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Monogeneans, earlier placed under trematodes, have come up as a very successful group, where parasite phylogeny mirrors host phylogeny. It is evident that more the number of host's species, more are the parasite species. They infect fishes primarily, and are also known from few invertebrates, amphibians, reptiles and even Mammals. Parasites and their hosts are closely associated due to their co-evolution (Agrawal et al., 2005) and during this period, host-parasite recognition mechanism improves. They are highly host specific, mostly ectoparasites, having a single host life cycle. The simple life cycle enables monogeneans to adapt to fishes, living in a range of habitats, having different ways of life including bottom-living flat-fishes and fast-moving pelagic species. They develop very sophisticated reproductive strategies to ensure their survival in various environmental conditions. Environmental conditions like seasons, temperature etc. further influence the life cycles. Not much information is available on reproduction of *Dactylogyrid monogeneans* in India. (Gusev, 1976; Agrawal and Sharma, 1996 & 2002; Agrawal and Bhatnagar, 1994; Agrawal and Bhatnagar, 1997 and Pandey et al., 2003). The reproductive strategies and the influence of environmental parameters on parasite life cycles exhibited by some Indian dactylogyrid monogeneans is observed. High fecundity compensates the loss, occurring during transmission. During development, some host factors may cause massive mortality, thus regulating adult population and recruitment of new worms.

Impact of Social Development on Fertility: A Case study of Satna District, M.P.

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An Investigation in to the association between social development and fertility has since long been of great demographic, social and Economic significance especially in the developing countries. In the present paper, the number of births within the last seven years of marital period to currently married women in the age group 20-25 years has been utilized to compare the fertility level of different subgroups of population. Also an index "social status" which depends on income, education, housing and availability of modern facilities in the household is used for measuring the development. Since religion/caste play an important role in the determining the occupation, education, social and cultural activities in the community in the rural areas .This factor is based on data taken for investigating their effect on fertility behavior.

Effects of Chromium on vital functioning and behavioural anomalies of a freshwater catfish, *Heteropneustes fossilis*

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Chromium, a heavy metal, enters the aquatic ecosystem through industries such as electroplating, polishing, paint, rubber, plastic, ceramics, fiberglass, chrome plating, chrome alloy making, welding and foundries. It exists in several valance states but only trivalent (Cr+3) and hexavalent (Cr+6) are biologically significant. Trivalent chromium plays a role in glucose and lipid metabolism. Hexavalent chromium is most toxic to mammals and fish, and is known to cross biological membranes with relative ease as compared to trivalent chromium. Hexavalent chromium damages the osmoregulatory and/or respiratory system of fish. The significant accumulation of Cr+6 is typically more widespread in gill, kidney and intestine, causing histopathological changes in these tissues and altering the carbohydrate metabolism. The hexavalent chromium also causes remarkable changes in the behaviour of the fish, *Heteropneustes fossilis*. Which were expressed as increased opercular movement, sluggish, lethargic and abnormal swimming, loss of buoyancy and muscular-tetany. The exposed fish also showed fading of their body colour.

Pesticidal Potential of Weeds in Sustainable Agriculture

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The population of the world is expected to grow exponentially to the tune of 9.7 billion by 2050. Innovative solutions are required to meet the ever-increasing demands for food, feed, and fiber for humans and animals. These requirements can only be fulfilled by protecting crops from pest losses, as despite enhancing the crop yields, the green revolution has verified unsuccessful in assuring long term agricultural sustainability. A variety of biotic and abiotic constraints affect crop production. Among biotic, infestation of weeds and insect pests are the most important constraints to agricultural production. Indiscriminate use of chemical fertilizers and insecticides has some serious flaws to environmental and health related concerns. Based on the statistics of chemical pesticide consumption, it is essential to search for alternative methods for the protection of crop yields, while conserving limited natural resources and maintaining quality of the environment. In such a situation, the use of pesticidal potential of weeds has emerged as a sustainable alternative leading to safe organic farming. Biopesticide-driven sustainable agriculture has social acceptability, promotes economic productivity, and engenders environmental stewardship. Sustainable agriculture serves as the most critical sector of the Sustainable Development Goals, and it integrates most aspect of the 17 SDGs, directly and indirectly. However, it is directly linked to SDG2 (Zero Hunger) and SDG1 (No Poverty).

Keywords: Weed, Biopesticide, Environment, Agriculture, Food, Sustainable Development Goals

Morpho-taxonomic Biodiversity of Tapeworm of fresh Water Fish from Central India

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For Biodiversity of tapeworm parasites collected the eleven fish with the help of fishermen. After thoroughly examination we found that one of the *Clarias batrachus* (Linn) yielded five moving parasites. These parasites were unsegmented tapeworms which were preserved in 5% formalin in the laboratory these parasites were thoroughly washed, stained, mounted and ultimately identified as new member of family, Capingentidae Hunter, 1930

Environmental Problem due to River Pollution: A Case Study on Yamuna River

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River Yamuna is the largest tributary of the River Ganga. The main stream of the river Yamuna originates from the Yamunotri glacier near Bandar Punch ($38^{\circ} 59' N 78^{\circ} 27' E$) in the Mussourie range of the lower Himalayas at an elevation of about 6320 meter above mean sea level in the district Uttarkashi (Uttanchal). The catchment of the Yamuna river system covers parts of the states of Uttaranchal, Uttar Pradesh (U.P.), Himachal Pradesh, Haryana, Rajasthan, Madhya Pradesh and the entire state of Delhi. The river Yamuna traverses a distance of about 1370 km in the plain from Saharanpur district of Uttar Pradesh to the confluence with river Ganga at Allahabad. The major tributaries of the river are Tons, Betwa, Chambal, Ken and Sindh and these together contribute 70.9% of the catchment area and balance 29.1% is the direct drainage of main River and smaller tributaries. On the basis of area, the catchment basin of Yamuna amounts to 40.2% of the Ganga Basin and 10.7% of the country. Yamuna is the sub-basin of the Ganga river system. Out of the total catchment's area of 861404 sq km of the Ganga basin, the Yamuna River and its catchment together contribute to a total of 345848 sq. km area which 40.14% of total Ganga River Basin (CPCB, 1980-81; CPCB, 1982-83). It is a large basin covering seven Indian states. The river water is used for both abstractive and in stream uses like irrigation, domestic water supply, industrial etc. It has been subjected to over exploitation, both in quantity and quality. Given that a large population is dependent on the river, it is of significance to preserve its water quality. The river is polluted by both point and non-point sources, where National Capital Territory (NCT) – Delhi is the major contributor, followed by Agra and Mathura. Approximately, 85% of the total pollution is from domestic source.

Key words: Yamuna river, Water Pollution, Industrial Effluents, Aquatic Ecosystem

Study of Gonado-somatic Index (GSI) of Male and Female striated murrels, *Channa striatus* (Bloch, 1793) in Etawah District

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Snakehead fishes of family Channidae play an important role in fish biodiversity with 32 total species. *Channa striatus* is an important fish of channidae family. It is very useful and economic important fish used as food, game, ornamental and pest controller fish in different regions. This is a native of Indian subcontinent, found in India, China, Pakistan, Srilanka, Bangladesh, Nepal, Vietnam and Malaysia etc. The culture production and conservation by aquaculture have much important for present scenario because the population of *Channa striata* fish species decline by several anthropogenic activities due to destruction of their natural habitats and over fishing. The reproductive biology has the important part of Gonado-somatic Index for the aquaculture production. It is direct effect to survival growth breeding mechanism and their technology formation. Present study provides the basic idea for the Gonad-somatic index which expresses the relative change in gonad weight to the percentage of body weight. Present study indicates the *Channa striatus* GSI in around Etawah District (Uttar Pradesh) India, during study period from January to June. GSI have increased with gonadal development and maturation of this fish. GSI value was minimum at January during pre-spawning period was 0.274 ± 0.014 and maximum at peak maturation period during June 4.32 ± 0.24 in female and in male GSI is 0.138 ± 0.026 minimum and 0.230 ± 0.018 maximum

Changes in Oxidative Stress Markers and Antioxidant Activities in Non-Pregnant Anemic Women before and after Oral Iron Medication

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Background & Aims: This study was aimed to assess the desirable and undesirable effects of iron (100 mg/day as ferrous sulphate) and folic acid (500 µg/day) supplementation in non-pregnant iron deficient anemic women.

Methods: Iron and folic acid supplementations were given to 117 non-pregnant anemic women (mild = 55, moderate = 40, and severe = 22) and 60 age matched placebo treated (100 mg cane sugar) non-anemic controls for 100 days. Blood index values, oxidative stress parameters, antioxidant enzymes and vitamins were estimated as per standard protocols.

Results: Haemoglobin (Hb) levels along with antioxidant enzymes, namely catalase, superoxide dismutase (SOD), glutathione reductase (GSH-Rd), reduced glutathione (GSH) and total antioxidant capacity (TAC) were found increased significantly ($P < 0.01$) in non-pregnant anemic women after treatment. However, the glutathione peroxidase (GSH-Px) with significant decrease of antioxidant vitamins A, C and E ($P < 0.01$) in all treated groups. Lipid peroxide levels (LPO), protein carbonyl (PC), conjugated dienes (CD), lipid hydroperoxide (LOOH) and oxidized glutathione (GSSG) levels increased significantly increased ($P < 0.01$) after oral iron supplementation groups. Besides, undesirable side effects of iron supplementation were noticed maximum in mild as compared with moderate and severe anemic groups, while nausea, vomiting, systemic reactions were negligible in all treated subjects.

Conclusion: Data obtained from this study provide new insights into establishing hypothesis for a recommended dose of iron effective for improving Hb, but at the cost of increased oxidative stress (mild > moderate > severe) as well as for iron supplementation on need basis rather than blind supplementation

Important of milk indigenous cow in human life

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The Indian cow which is traditional from time immemorial, that too Prithvi Lok Whether or not Devlok has ever been in the original form of today's modern scientist, not even the race to be ahead, hegemony over all, due to his mental narrow perversion; The challenge of erasing the basic principle itself from its root, due to which many diseases are also being suffered in the form of defects, the more we live in our original form i.e. according to nature; In the competition of the so-called above, the divine power received by nature and self, natural wealth which we have got without any reason; eg. Natural oxygen which is produced only by the growth of the tree, it will get support only if it is ground/practical Otherwise, as per "Indian Ayurveda, everyone has to live his own mini 100 years; maxi like this all the wealth of nature is for everyone earth, living beings, human beings, secure it According to this, we have to keep our Indian cow as well, so cross from Exotic breed; Apart from the increase in milk! And the quality that was in our country's cow's milk What. Exotic milch cow's milk has that much quality Earth has to be saved from Chemical Fertilizer, which is the proud culture of India, in which Indian Cow has been given the status of mother cow, in the presence of cow dung manure, earthworms , Vermicomposting which is absolutely essential for the health benefits of the earth, (not chemical), from which friend kit kite, farmer friend earthworm will help only from life. Scientists are doing the work of foreign destroyers by creating distortion India's sages have been great ideal scientists and they are worthy of worship. According to him, the culture here, living tolerance, animal husbandry, rearing of special mother cow and that special quality and importance in them, ideal milk, has been there even today. Apart from quality protein, cow milk is filled with calcium, vitamin D, phosphorus and magnesium. The combination of these essential nutrients is highly beneficial for the overall development of your body. Milk is essential Cow milk has been used globally for its nutritive and medicinal values in all age groups. "Cow's milk has 10 properties: sweet, cold, soft, unctuous, dense, smooth, viscous, heavy, slow and pleasing." It is said to enhance tissues and immune resistance. Many cow products are used for their health promoting, disease-preventing and therapeutic purposes. Besides its nutritive use, milk and milk products are used in conjunction with medicines to enhance their pharmacokinetic and dynamic benefits. In Ayurvedic rejuvenation programmes, milk is central to tissue regeneration. It contains many beneficial proteins, hormones, growth factors, vitamins and minerals. Cow milk is constituted of Water – 87%, Carbohydrate (Lactose) – 4.8%, Fat – 4%, Protein (Casein, Whey, Glycoprotein) – 3.4%, Minerals (Ca, K, I) – 0.8%, and Vitamins (A, B2, B12). Casein forms about 80% and whey protein forms about 20% of the total protein content in the milk.

Effect of Climate Changes on quality milk production

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INDIA'S achievement of transforming itself from a milk-deficient country to the world's largest milk producer has been exemplary. With over 136 million bovines producing about 198 million tonnes of milk in 2022-23, the Indian dairy sector exhibits strong growth potential. Nonetheless, the country has a small share in the global dairy trade. Milk production is an integral component of Indian agriculture, supporting the livelihood and food security of more than two-thirds of the rural population. The demand for milk is buoyant owing to population and income growth and increasing urbanization. As per the estimate of the National Dairy Development Board, the demand for milk and milk products in India is expected to be around 266.5 million metric tonnes by 2030. Recent growth trends in the Indian dairy sector have shown its resilience to external shocks such as the Covid-19 pandemic. However, when it comes to susceptibility to climate shocks, there is ample evidence to suggest that the sector in India is highly vulnerable.

The performance of livestock is strongly influenced by the thermal environment. The anatomical and physiological characteristics of livestock help them adjust their body temperature, within a limited range, to remain productive. Ambient temperatures above the thermo-neutral range not only cause stress in the animals, directly impeding their growth and productivity, but also impinge on various factors crucial for livestock production, such as water availability, feed and forage quality, reproduction and health. When exposed to such stress, dairy animals display a variety of behavioral and physiological acclimatization as essential survival strategies, but at the cost of decreased milk production. The extent of production losses is largely conditioned by genetic potential, life stages, nutrition and habitat management practices. Studies have indicated that indigenous breeds of cattle are more thermo-tolerant, while crossbred cattle are highly sensitive to heat stress. Buffaloes, though natives of a tropical climate, are also sensitive to thermal stress owing to their thick black skin with sparse hair coat and fewer deeply situated sweat glands, compromising heat dissipation through evaporative heat loss.

Keywords: Milk, Temperature, Climate,

Essential Measures for Protection of Plant Diversity

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Weed is considered to be causes of health problem in human and responsible in yield losses in several crops in the country and has also caused a 90% drop in forage production. Weed control is important in plant diversity. Allelopathy is an environmentally advantageous method that can control weeds by inhibition of weed seed germination and growth. *Lantana camara* is well known for its industrial, pharmacological and toxicological uses as well as its essential oil content and phytotoxic activity. Therefore this research aimed to obtain various concentration of aqueous extract from *L.camara* leaves extract used for weed control.

Effects of Genetic Improvement in Livestock

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Livestock populations provide people with a variety of products and services, including meat, milk, eggs, fibre and draught power, in a wide range of environments. This diversity of function is only possible because of the diversity of their genetic make-up. The genetic variation within livestock populations also provides the raw material both for evolution through natural selection in response to changing conditions and for human-managed genetic improvement programmes. It is vital both to efforts to increase production and to the adaption of livestock populations to challenges such as climate change; emerging diseases and pressures on feed and water resources. Animal genetics is one of the pillars of livestock development (alongside animal health, animal nutrition and husbandry issues such as housing). It is a broad field, ranging from characterization to conservation to genetic improvement, and involves actions at local, national, regional and global scales. Genetic improvement (animal breeding) is based on the principle that the products (milk, meat, wool, etc.) and services (e.g. transport, draught power or cultural services) provided by animals are a function of their genes and the environmental influences that they are exposed to. Improvement can be achieved by selecting genetically superior animals to be the parents of the next generation. “Genetically superior” means superior in terms of a particular set of characteristics, which usually include productivity in the environmental conditions expected in the future, but should also consider traits such as fertility, disease resistance or longevity that relate to costs of production.

Key Words- Livestock, Genetic, Environment.

Climate change and Sustainable Development

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Global warming produces negative impacts on human systems as well as on natural resources, which impedes the progress towards some sustainable development goals. The most significant challenge in achieving sustainable development is climate change, and it threatens to drag millions of populations into grinding poverty. Collective efforts, reflecting different circumstances and capabilities at all levels, are needed to limit the global warming to 1.5C, taking into account equity and effectiveness, so that we can strengthen the global response to climate change, and achieve sustainable development and poverty eradication. The aforementioned challenges are tried to solve in this paper.

Impact of Climate change on Livestock

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This issue of Animal Frontiers, “Climate change: impact on livestock and how can we adapt,” focuses on the effects of climate change (global warming) on livestock health, well-being, production and reproduction, and on possible adaptation and mitigation strategies that can be put in place to reduce negative impacts. Recently the intergovernmental group of experts on climate change gathered in South Korea to bring attention to the urgency of this situation: global warming is increasing and ecosystems, animal species diversity, and food security are at risk. It is now well accepted that the increasing concern with the thermal comfort of agricultural animals is justifiable not only for countries in tropical zones, but also for nations in temperate zones where high-ambient temperatures are becoming an issue. At a global level, animal production must increase in the next decades to satisfy the growing need for animal-sourced foods. We have to expect that livestock systems (based on grazing, mixed farming systems, or industrialized systems) will be more and more negatively affected by climate change, especially global warming.

Key Words- Climate, Global warming, Effects.

Climate Change and Our Future

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Global climate change is not a future problem. Changes to Earth's climate driven by increased human emissions of heat-trapping greenhouse gases are already having widespread effects on the environment: glaciers and ice sheets are shrinking, river and lake ice is breaking up earlier, plant and animal geographic ranges are shifting, and plants and trees are blooming sooner. Effects that scientists had long predicted would result from global climate change are now occurring, such as sea ice loss, accelerated sea level rise, and longer, more intense heat waves. Some changes (such as droughts, wildfires, and extreme rainfall) are happening faster than scientists previously assessed. In fact, according to the Intergovernmental Panel on Climate Change (IPCC) — the United Nations body established to assess the science related to climate change — modern humans have never before seen the observed changes in our global climate, and some of these changes are irreversible over the next hundreds to thousands of years. Scientists have high confidence that global temperatures will continue to rise for many decades, mainly due to greenhouse gases produced by human activities.

Key Words: Climate, Global, Earth.

Conservation of Biodiversity in the perspectives of our Rural Livelihood

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Existence of Homo sapiens is quite impossible without the presence of a healthy ecosystem either in terrestrial or maybe aquatic. Our environment comprises all living and non-living components and their interactions within a natural ecosystem. Biodiversity is all the different kinds of life you'll find in one area—the variety of animals, plants, fungi and even microorganisms like bacteria that make up our natural world. Biological diversity forms the foundation for sustainable development, constitutes the basis for the environmental health of our land and is the source of economic and ecological security for our coming generations. Scientists estimated that since 1500 AD, 851 species have been extinct from our Earth and it also predicted that there may be around 1473 species vanished mostly are amphibian due to human encroachments, deforestation, pollution, global warming etc. In the developing country like us, biodiversity provides the assurance of food, many raw materials such as fiber for clothing, materials- for shelter, fertilizer, fuel and medicines, etc. and so on. Each of these species and organisms work together in ecosystems, like an intricate web, to maintain balance and support life. Over half of global GDP is dependent on nature. More than 1 billion people rely on forests for their livelihoods. And land and the ocean absorb more than half of all carbon emissions. But nature is incrisis. Up to one million species are threatened with extinction, many within decades. Appropriate measures should be taken by individual levels, organizational or respective Governments to combat this crisis as well as economic and ecological perspectives of our nation.

Key words: Biodiversity, Conservation, healthy ecosystem, rural livelihood.

Qualitative Analysis of underground water in Industrial/Urban areas of Kanpur

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Water is the most essential natural resource necessary for the survival of every organism on earth. Two-thirds of the earth's surface is covered with water and the human body consists of seventy-five percent water by weight. Hence, evidently it is clear that water is one of the prime compounds responsible for life on earth. It has similar actions while circulating in the soil and in the human body, i.e. transporting, dissolving and replenishing nutrients and organic matter, and carrying away waste substances.

An average adult human body(70kg) contains about 42 litres of water and in just a small loss of ~2.7 litres, one may become dehydrated, or show symptoms of irritability, fatigue, nervousness, dizziness, weakness, headaches and consequently, might reach a fatal state. So it becomes very important and essential to test the water before it is used for drinking purposes.

The main aim of this study was to examine the impact of industrial and urban activities on underground water in industrial areas of Kanpur. Mainly three types of impurities are found in the water, viz., physical, chemical and biological. Water must be tested with different physio-chemical parameters. Physical tests must be performed for testing of its physical appearance, such as temperature, pH, odour, color, turbidity, TDS, hardness, total alkalinity and for testing toxic substances such as arsenic, lead, cyanide etc.

For this purpose a laboratory study was conducted for the quality assessment of ground water in some selected areas of Kanpur. Eight water samples were collected from different locations of the city (Four open-wells and four bore-wells).

The pH of the water varied between 7.2 – 7.6. The average TDS of the water was 433.6 mg/l. Turbidity was very less (< 1.0 nephelometric turbidity unit). Average hardness of the water was 175 mg/l. Average alkalinity was 70.6 mg/l. Chloride content varied from 39 mg/l to 50 mg/l.

The results were analysed with standard values prescribed by the WHO (World Health Organization).

Keywords: Qualitative Analysis, Turbidity (Nephelometric turbidity unit), World Health Organization (WHO), Irritability

Effect of LSD in Bovidae Animals

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Lumpy skin disease (LSD) is a viral disease of cattle. Characterized by nodules on the skin, it is mostly transmitted by mosquitoes, by other hematophagous insects, and flies. The disease has dramatic effects on rural livelihoods, which are often strongly dependent on cattle, as it slashes milk production and may lead to sterility in bulls and fertility problems in females. It damages hides, and causes death due to secondary bacterial infections. Effects at national level are also devastating as the presence of the disease triggers strict trade restrictions. Although traditionally limited to LSD has slowly been invading new territories such as the most of the the where the disease continues to spread. The risk of an imminent incursion into neighboring, still unaffected countries is very high. In the current situation, veterinary services from affected and at-risk countries in the Middle East and Europe are facing the disease for first time. Official veterinarians, cattle farmers, and others along the value chain are therefore unfamiliar with LSD's clinical presentation, its transmission routes and the available prevention and control options. This manual aims to fill these gaps by providing veterinary professionals and paraprofessionals with the information they need to promptly diagnose and react to an outbreak of LSD. Cattle farmers will also benefit from reading it.

Lumpy skin disease (LSD) is a pox viral disease of cattle with a major socio-economic impact. The disease is characterized by fever, multiple firm, circumscribed skin nodules, and necrotic plaques in the mucous membranes (chiefly of the upper respiratory tract and oral cavity) and swelling of the peripheral lymph nodes. Lumpy skin disease (LSD) causes huge economic losses in the livestock industry. It is caused by Lumpy skin disease virus (LSDV), which belongs to the family Poxviridae, with the Neethling strain the prototype. LSDV belongs to the genus Capripoxvirus that includes sheep pox virus and goat pox virus. The incubation period for lumpy skin disease is between 4 and 14 days post-infection. After an initial period of high fever (41°C) and swollen lymph glands, the animal may develop large, firm nodules that are up to 5 cm in diameter in the skin. LSD is a disease of cattle and water buffalo. It is a vector-borne disease transmitted by different biting and biting blood-feeding arthropods. LSD Causes considerable economic losses due to emaciation, damage to hides, infertility, mastitis, loss of milk production, and mortality of up to 20%.

Scientific evaluation of Laata- a traditional compound formulation prevalent in Chitrakoot region of Madhya Pradesh-India

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Chitrakoot region is a remote area situated in the northern region of Satna district of Madhya Pradesh, India. It has strong local health traditions including home remedies and nutritional food materials in which medicinal plants play an important role. There is several folklore delicacies with herbal compound formulations used to maintain the healthy life. The present study highlights the documentation and standardization of traditional herbal nutritious compound formulation locally called Laata, prepared with dry Mahua flowers (*Madhuca longifolia* flowers with other ingredients) uses as nutritious dietary supplement by tribal and folk communities of Chitrakoot region of Madhya Pradesh. The study deals with Pharmacognostic investigation, macroscopy, powder microscopy, physicochemical parameters, detection of heavy metals, nutritional value analysis, screening of microbiological parameters and high performance thin layer chromatography (HPTLC) fingerprints profile of methanolic extract. Microbiological analysis of pathogenic bacteria, viz. *Salmonella* sp., *Escheria coli*, *Pseudomonas aeruginosa* and *Staphylococcus aureus* were done and found that absent in Laata samples, similarly detection of heavy metals (Pb, Cd, As & Hg) tests were performed and found under limits/absent as per WHO guidelines. Besides, nutritional value tests of four compound formulations of Laata were analyzed such as total calories range 395.10-469.91kcal/100gm, total carbohydrates range 45.60.54-57.18.73g/100gm, total fat 17.40-22.63.54g/100gm, protein 10.75.54 -13.56.88g/gm, vitamin c 2.00.55-3.39.07mg/100gm, dietary fibre 3.90.58-4.89.47g/100gm, Iron 8.60.84-10.48.52mg/gm, Calcium 12.50.44-17.72.19mg/gm, Sodium 62.34.79-80.20.88mg/gm and Potassium 105.60-155.70.06mg/gm were found. These finding indicate the Laata (a traditional herbal nutritious compound formulation) is a very good traditional herbal recipe used by tribal of Chitrakoot region to maintain good health. These types of practices if integrated with the modern healthcare system could elevate the health status of thousands of rural people as well as urban people.

Vermicomposting training: One step towards entrepreneur

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Vermicomposting training, allows students to gain practical experience in their chosen career path before they even graduate." Students who finish those rigorous programs, have the credentials and training they need to get started right away in their chosen career path. In my point of view on vermicomposting training on students as income generating enterprise is best option because the agrarian system of our country is in state of transition from subsistence oriented to commercialization. The modern farming system is gradually becoming unsustainable and the increasing problems of chemical agriculture, cost of cultivation and upsetting environmental as well as health impacts have many negative impacts over agrarian society. The vermicompost production plays a major role in organic production of all types of field crops, vegetables and fruits etc. Vermicomposting is a method of preparing enriched compost with the use of earthworms. It is one of the easiest methods to recycle agricultural wastes and to produce quality compost. This organic input production could become an income generating activity. Therefore vocational training on vermicomposting, under NEP 2020 was conducted by department of zoology for under graduate students of various colleges of Jabalpur in St Aloysius college campus. The skill regarding production of vermicompost and pit compost were imparted to a group of 35 students through lectures, demonstration and hand on training for different vermicompost, vermiculture and vermiwash, etc. After completion of the training course, the outcome was evaluated through an exam and using appropriate test on prepared compost like Phosphorus, Nitrogen and Potassium quantity has done in the zoology lab. The study revealed that 65 per cent of the trainees adopted vermicompost production on a commercial basis as an income generating source in future

Diet and life style pattern in accordance to Body constitution: An Ayurvedic view

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Ayurveda is a science of life and also cover “Art of living”, which achieve happiness. According to Ayurveda, body constitution (Prakriti) is a unique nature of every person. This fact can be easily observed in a group of persons having same race, sex, age, height and weight. It will be noticed that for maintaining health the needs of each person are different. They may prefer different food, drinks and exercise, to remain healthy. Some will require warm diet, drinks and warm climate while others will require cold diet, drink and cold climate. If we analyze blood, serum or urine we may not find any substantial difference. Yet the differences clearly exist in the persons having race, sex, age, height and weight. As a result of this Ayurveda prescribes a different diet and life style pattern for each person based on his constitution. Ayurveda has individualistic approach, for maintaining health as well as for treating the disease. Predominance of Tridosha namely Vata, Pitta and Kapha decides the body constitution such as Vata prakriti, Pitta prakriti and Kapha prakriti, etc. This Doshic constitution (human biotype) is the important in the examination of health and disease. Hence Doshic constitution is usually determined.

Tolerance to diet, drinks environment depends upon the type of constitution. This cannot be decided by the analytical study of the body tissue. By understanding the constitution of a person, one can choose appropriate diet, drink and environment. As there is predominance of dosha in each person, each type requires substances opposite to the constitution to maintain health. Vata constitution will be having predominance of dry, light and cold qualities; hence to maintain health, these persons will require opposite qualities e.g. oily, heavy and warm quality diet, drink and environment, otherwise there is always a tendency to increase Vata, giving rise to Vata disease.

Hence for maintaining of health, every person should know his Prakriti as well as Vikriti. If daily activities, diet, occupation and behavior are not adjusted to balance this, then the constitutional humour will increase giving rise to its characteristic diseases. This change in life style is not an easy thing for many people. It is a short of challenge to them. But if they are properly convinced it's healthy effects they can follow this change in life style according to the human body constitution.

Indigenous Technical Knowledge (ITK) for Sustainable Agriculture in India

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Indigenous Technical Knowledge (ITK) has enormous innovation potential. India is a land of indigenous communities, the majority of which have their own set of distinct traditional knowledge and technology. India's population is rapidly increasing, as is the demand for food. ITK is the totality of knowledge and practices based on people's accumulated experiences in dealing with situations and problems in various aspects of life, and such knowledge and practices are unique to a specific culture. Many of these knowledge and technologies are on par with the modern knowledge and technology system and have provided comfort and self-sufficiency to indigenous communities. These traditional knowledge and technologies have the potential to play an important role in the overall socioeconomic development of communities. It has been discovered that there is an immediate need to document and preserve Indigenous Technical Knowledge.

(ITK) of various communities, many of which are on the verge of extinction. There is a misalignment between indigenous and modern knowledge practice. There are serious issues related to intellectual property rights. An appropriate association between the traditional and modern knowledge and technology systems has immense potential to benefit the society. These ITKs are able to maintain the agricultural sustainability as well as food and nutritional security.

Organic farming in India: Benefits and Challenges

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As people become more aware of the food they eat, their relatives and family members, there is a growing emphasis on health benefits. As a result, there is a degree of development for organic farming products. Previously, people would spend money on high-quality local vegetables, heartbeats, and organic products. This brought about a life span and solid way of life. This paper provides an overview of the benefits and challenges of organic farming, as well as the current situation in India. Agricultural development policy in developing countries must focus on increasing crop productivity while lowering costs and increasing product efficiency while causing little or no harm to both humans and the environment. Nedumaran and colleagues (2020) Organic farming systems have grown in popularity. They have received a lot of attention over the last decade because they are thought to offer some solutions to the problems that are currently plaguing the agricultural sector. Organic farming has the potential to provide environmental benefits, conserve non-renewable resources, and improve food quality.

Dwivedi and Charyulu (2016) Organic farming is a societal necessity; it stems not only from consumer demand. But also from the perspective of a farmer. Organic farming may become a panacea for transforming rural agriculture into a well-sustainable agriculture that can build a foundation for sustainable agriculture, reimburse conversion costs, and maintain soil sustainability.

Effectiveness of Defoliating Agent, *Zygogramma bicolorata* for the biological control of *Parthenium hysterophorus* in Chitrakoot

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Parthenium weed is an exotic weed that poses significant threats to biodiversity, crop production, human and animal health. Few experiments have been carried out to test the effectiveness of this biological agent, *Zygogramma bicolorata* against this aggressive weed. We released this Mexican beetle to control the Parthenium weed at the different local areas of Chitrakoot. *Z. bicolorata* is very selective host specific beetle which do not feed on other beneficial crops. Feeding by this beetle reduced the Parthenium leaves and flowers. Under the highest beetle population treatment *P. hysterophorus*, flower numbers were greatly reduced under the high beetle populations. They feed by making a whole in the apical leaves and buds by scraping the mesophyll tissues which disturbed the photosynthesis activity of plant and ultimately control the growth and flowering of Parthenium plant which is very useful to control the Parthenium weed. We conclude that this Mexican beetle can be used as biological agent to control the *P. hysterophorus* in Chitrakoot when released in large numbers. The eggs on cloth were easily transported and augmented in the different sites which is very easy and low cost technology, which can be used by farmers in their field after getting very simple training.

Perspective Analysis of Smoking and Non-Smoking Population infected with Tuberculosis in Jaunpur

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Tuberculosis (T.B.) is potentially contagious disease affecting human population globally leading to a million of deaths in year 2021. In all over the world, India is highest T.B. burden Country ranked second in regarding T.B. mortality cases. Aim of this work is to detect patients of tuberculosis living in different areas of district Jaunpur (UP) either rural or urban to see role of various socio demographic factors in prevalence of T.B. infection. Study was based on survey using a questionnaire, beside that full records of patients were also taken from clinical and radiological diagnosis to collect qualitative and quantitative data. Out of total hundred patients surveyed randomly 62% percent were males and 38% percent were females, number of males was found higher in comparison to females most probably because of their more exposure to polluted environment, overcrowding at work place, lack of education and smoking habit.

Economic condition was also found correlated with prevalence of T.B. The ratio between APL (above poverty line) and BPL (Below poverty line) patients was found to be 28% and 72% respectively. Most of the patients belongs to poor economic conditions, so they hardly could find a balanced diet, because of poor nutrition they lose their body immunity and get infected with the disease more easily. Other than these it was also found that cases were found more in illiterate and smokers as compared to literate and non-smokers.

Bioremediation of soil by biochar

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Soil pollution is the accumulation of material in the soil at a level that is hazardous to organisms' growth and health. Persistent organic compounds and other heavy metals such as Pb, Cd, As, Hg, Zn, and Cu, are the most prominent types of soil contaminants. These compounds are harmful to plants and an animal, including humans, when they reach a critical concentration. Biochar is a carbon-rich material produced by pyrolyzing biomass. Biochar can help with remediation by permanently eliminating contaminants from the soil and so blocking the path to receptors. Pollutants cannot cause damage after sorption on the biochar surface. Different pesticides and other organic contaminants bind well to biochar prepared from different feedstocks. The use of biochar to remove organic pollutants from the soil is significant, especially for fungicides, herbicides, and pesticides (such as insecticides such as chlorpyrifos, pyrimethanil, synthetic pyrethroids). Biochar helps to reduce nutrient leakage when applied to soil. Increased soil nutrients, soil amendment, nutrient adsorber, improved soil fertility, enhanced soil capacity, adsorbed cation, pathogen management, and moderate organic and inorganic pollutants are only a few of the benefits of biochar.

Keywords: Soil pollution, heavy metals, pesticides, biochar, soil remediation, significance.

Study of Health Monitoring of Marble Rock Workers & Cement Workers in Jabalpur District

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Exposure of marble dust and cement dust is great risk and cause many pulmonary diseases in marble stone workers and cement workers. The aim to the study was to find out the occupational health risks posed by the dust to the workers in Jabalpur City. The cement and marble dust consists the concentration of silica and the heavy metals and long exposure to silica causes Silicosis, Emphysema which is a type of chronic obstructive pulmonary disease. Deposition of dust on the skin and eyes causes irritation to the eyes and may develop conjunctivitis. Deposition of the heavy metals may cause kidney and brain damage and lung cancer. The study was designed to investigate the effects of airborne dusts on the lung function of construction workers and also focused on investigating the knowledge, practice and perception of the sand stone quarry workers.

Key Words: Marble dust, Cement dust, Silicosis, Emphysema

Impact on farmer's mental health due to climate change in Satna district

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Climate change is one of the considerable challenges of this time. Climate is the main determinant of agricultural productivity. Climate change is a global challenge that is likely to have a substantial effect on humanity. Not only should climate change affect physical health, but it can also affect the mental health of farmers. Increasing ambient temperatures is likely to increase rates of aggression and violent, suicides, while prolonged droughts due to climate change can lead to a greater number of farmer suicides. Droughts otherwise can lead to impaired mental health and stress. Increased frequency of disasters with climate change can lead to posttraumatic stress disorder, adjustment disorder, and depression. Climate change is affecting farming and production is either low or non-existent, resulting in economic losses to farmers and their mental condition is also affected due to which more farmers are leaving agriculture and going towards other works. It is observed that migration caused due to mental disorder of farmers

Keywords; climate change, farmers, mental health

Nutritional Evaluation of Selected Macrofungi (Mushroom) from District Ayodhya, Uttar Pradesh, India

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There is worldwide need for alternative source of high quality and protein rich food components which control food insecurity and malnutrition. Due to the nutritional importance, macrofungi (mushrooms) are utilized and consumed frequently by villagers of Ayodhya district. In this district the nutritional value of reported macrofungi has been not studied. In current study, eight selective wild macrofungal sample were collected from different sites of study area such as *Calocybe indica*, *Macrolepiota procera*, *Pleurotus ostriatus*, *Tuber aestivum*, *Auricularia auricula judae*, *Hygrocybe eburneus*, *Boletus edulis* and *Ganoderma leucidum*. The sample was prepared for nutritional analysis and their nutrient composition has been analysed as findings result. Nutritionally the protein, carbohydrate, lipid, fibre, and ash content were analysed and ranged between 21.14 – 46.32%, 11.70 – 66.03%, 0.96 – 3.60%, 4.32 – 24.31% and 3.91 – 12.70% respectively. The overall nutrient showed that all collected (selected) macrofungi contains rich protein and carbohydrate content with low lipid (fat) content. The present study expresses and reveal the nutritional component as useful awareness to minimize malnutrition for peoples as well as society.

Keywords: Wild Edible Macrofungi, Nutritional Analysis, Mushroom Mycoflora, Ayodhya.

Bioacoustics of Domestic Cat (*Felis catus*) in Chitrakoot

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Vocalization is a common way for communication among the humans as well as animals. Through Bioacoustics, animal behaviour is analysed through its vocalization and sounds. The study is focussed on the acoustic analysis of vocalization of domestic cat in context of different behaviour and activities. In the current study, 11 types of vocalizations of a domestic cat (*Felis catus*) with different behaviour and activities were recorded and analysed. The observations were taken from March to May of year 2022. We found after analysing its sound that cat produce different sound during different behaviour. It was found in the current study after recording cat vocalization with mobile recorder and analysing the recorded cat sounds with Sound analysing computer application “PRAAT”, cat produce different sound in different behaviours having different acoustic characters (intensity, pitch, pulse, jitter and shimmer). Different observed sounds with its acoustics character (intensity); morning sound (64.199 dB), the stress call of hunger in the morning (71.89dB), stress call for food in the evening (57.44dB), snoring sound (66.94dB), meow sound of fear (87.58dB), aggressive sound of irritation (90.97 dB), weeping sound (77.93dB), clinging sound (76.59dB), call for mother (84.48dB), caterwaul sound (88.07dB), and chirrup sound (77.79 dB). Bioacoustics of domestic cat is useful to understand cat behaviour and vocal communication in cats. It may be helpful to conserve biodiversity and cats.

Key words: Bioacoustics, Vocalization, Behaviour, Communication, and PRAAT

Study on Analysis of Rotifers in Mandakini River in Chitrakoot

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India is endowed with a lot of diversity and distinctive traditional water bodies. Although nature supports a very big number of population and variety but still human over exploitation overcomes it. Water bodies are over polluted by human beings and by which the rivers and groundwater are highly polluted and in resultant, passing through a very critical survival conditions of aquatic fauna. Pollution of water bodies leads to the increase in imbalance of aquatic ecosystems and which indirectly affects terrestrial ecosystems and through terrestrial to the overall biodiversity. The present study is focused on status of rotifers in Mandakini River in Chitrakoot. 10 rotifers were collected and identified in the present research work. Because of pollution in Mandakini River, very few rotifer diversity was observed in Mandakini river. Government and local person should also pay much attention on this prospectus.

Key words: Rotifers, Restoration of ecosystem, pollution, river ecosystem.

Copper Sulphate Toxicity to Freshwater Prawn, *Macrobrachium Lamarrei* (Crustacea- Decapoda)

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Heavy metal pollution is caused by natural as well as anthropogenic activities which are of global concern now days. Copper, “a gray listed” heavy metal, despite being an essential micronutrient becomes highly toxic when present in excess quantity. Thereby adversely affecting aquatic flora and fauna. CuSO_4 is widely used as weedicide in aquaculture pond therefore; proper standardization of dose becomes necessary. *Macrobrachium lamarrei*, small freshwater prawns, were subjected to static bioassay tests showed LC_{50} values as 0.36, 0.32, 0.28 and 0.25 mg/l for 24, 48, 72 and 96 hrs respectively. LC_{50} show inverse relationship. Prawns showed behavioural alterations like initial hyperactivity thereby reduced swimming and appendage movement, loss of equilibrium, increased surfacing, darkening of cuticle, increased mucus secretion in gills and whole body and finally intense letharginess. Food consumption was found reduced mainly due to detection of food. Behavioural parameters are foremost indicator of physiological damage, being non invasive they can serve as better biomarkers for metallic pollution and monitoring of surface and drinking water quality. Freshwater prawn, a potential candidate for freshwater aquaculture, can also serve as better bio-indicator of Cu toxicity. Findings of present investigation will also be helpful for freshwater aquaculture practices.

Keywords: Behavioural alterations, Copper toxicity, Freshwater prawn, *M. lamarrei*

Clinico-Etiopathogenesis of Divalent Metal Transporter 1 Gene Variation on Iron Deficiency Anemia Patients.

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Abstract

Background- Iron deficiency anaemia is the burning health issue of adults as well as children in India, which is evaluated by deficiency in serum ferritin level, mean corpuscular hemoglobin (MCH) and mean corpuscular volume (MCV). DMT1 mutations primarily affect iron utilization and not absorption. Thus, we aimed to evaluate the correlation of clinical pathophysiology and DMT1 gene variation in iron deficiency anemia patients.

Methods- A total 140 IDA patients and equal numbers of control were registered for study. Hemogram analysis was done by automated hemato -analyzer while CRP and Serum ferritin test done by ELISA method. ESR test was done as per Wintrobe method. Genotyping of DMT1 gene variation was done by using PCR-RFLP method

Result- Two DMT1 gene mutations, namely the IVS4+44C>A and c.2044T>C were analysed. Amongst the patients, 14 were heterozygous for IVS4+44C>A mutation. Twenty-eight patients were heterozygous for c.2044T>C mutation while 08 homozygous for IVS4+44C>A genotype and 9 were homozygous for c.2044T>C genotype. Controls were presenting 12 heterozygous for IVS4+44C>A mutation and 11 heterozygous for c.2044T>C mutation while 4 homozygous were identified for IVS4+44C>A mutation and 5 homozygous were reported for c.2044T>C genotype in IDA patients. Severity of clinical symptoms is worsening in non-mutant.

Conclusion- After studying the DMT1 polymorphism on iron deficiency anemia, the frequency of clinical symptom is found to be less severe in IVS4+44C>A and c.2044T>C mutation. While, finding of this research also showed the IVS4+44C>A and c.2044T>C mutation may be predictor of iron deficiency anaemia and need diagnosis of these DMT1 variants genotype.

Phenological Impression of Cassia Tora in Shivtarai Chhattisgarh India

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Chhattisgarh state is being placed in Deccan Biogeographical Area. The study of phonological and various periodic behavior of Cassia tora (family Leguminosae) species in Shivtarai area in Block Kota District Bilaspur (C.G.) . The phonological has very important characteristic feature of plant provided knowledge and atmospheric effect on germination of seed, flowering, fruiting; Very most of this work is based on agriculture lands, canals, and forest wild plants. There is very Important work on the phenology of medicinally and Economic important plant species. There is wide fluctuation in the phenology of aspecies form region due to changes in the climatic conditions (Krishnaswamy and Mathuda 1954)

Key words: Phenological , Atmospheric, Germination, Flowering, Fruiting.

Impact of Different Hardening Substrate on Growth and Survival Rate of in Vitro Raised Plantlets of Orchids (*Dendrobium Nobile*)

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The present experiment entitled “Impact of different hardening substrate on growth and survival rate of in vitro raised plantlets of orchids (*Dendrobium nobile*).” was undertaken with a view to analyse the effect of different hardening substrates at Poly house of Commercial Tissue Laboratory, College of Agriculture, Indira Gandhi Krishi Viswavidyalaya, Raipur, Chhattisgarh during 2019-20. The experimental layout was in Completely Randomized Design (CRD) with sixteen treatments replicated thrice. The results indicated that the maximum value for parameters including plant height, number of leaves plant-1 , length of leaf, width of leaf, leaf area, leaf area index, survival per cent has been recorded in T8 (chopped coconut husk + brick + charcoal + cocopeat) while the maximum shoot girth has been recorded in T2 (bark + brick + charcoal + cocopeat) and maximum number of root plant-1 , length of root, root volume has been observed in T9 (chopped coconut husk + brick + charcoal + ricehusk).

The treatment T8 achieved better results as it contained coconut husk, brick pieces, charcoal and cocopeat. Where, coconut husk is best suited for improving the water holding ability of the substrate and nutrient content at initial phase, brick pieces help in providing good aeration and mechanical support to plants, charcoal is also helpful in providing aeration and retaining fertilizer when pouring fertilizer solution and it steadily transfer nutrients to developing plants on subsequent watering, cocopeat carries eight times of water of its own weight it improves water holding capacity of media and also releases nutrients over long periods. While treatment T10 gives minimum result in almost all parameters might be due to the reason that medium containing chopped paddy straw, brick and charcoal could not supply enough support and nutrients required for the growth. Therefore the media combination T8 (chopped coconut husk + brick + charcoal + cocopeat) may be recommended for hardening media of orchids.

Biodiversity of Herbal Medicinal Plants of Surguja District in Chhattisgarh

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Surguja is a tribal dominated district in the north-eastern part of the Chhattisgarh state of the India. surguja district harbours rich biodiversity of medicinal plants. People of Surguja district, using indigenous medicinal plants for the treatment of various diseases. The documentation of diversity and traditional uses of medicinal flora can prove pivotal in the conservation and sustainable use of plant resources in Surguja district. This baseline information on traditional uses of medicinal plants can also provide information regarding designing and development of future drug. During April 2019 to March 2020 phytosociological survey has been conducted in Lundra, Ambikapur, Udaipur, Lakhanpur and Batauli Block of Surguja district in Chhattisgarh. Total 105 species of medicinal herbaceous plants were recorded in all the five block of study area, in which 102 were dicot and 3 species were monocot. 105 species belonging to 36 families. Fabaceae is the largest family with the 12 species, followed by Asteraceae family. Ten species belongs to Asteraceae family. Amaranthaceae family and Lamiaceae family are represented by 8-8 species respectively. Cassia tora was dominating species with the IVI value 21.23. Co-dominant species were Calotropis procera (IVI 20.9), Argemone maxicana (IVI 19.1) and Ocimum basilicum (IVI 14.67).

Key words: phytosociology, IVI, floristics, dominant species.

***Moringa oleifera* Lam. “Good Source for Malnutrition and Human Health Cure”**

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Moringa oleifera belong to the family of Moringaceae is an effective remedy for malnutrition. It is the best useful tree and with an enormous amount of minerals (like as copper, potassium, iron, magnesium, zinc and calcium (Kasolo et al., 2010).), vitamins (like betacarotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and F also present (Mbikay, 2012).), amino acids (lycine, leucine, isoleucine, methionine, cystine, phenylalanine, tyrosine, valine,) and other beneficial phytochemicals. *Moringa* leaves contained 27.2% protein, 17.1% fat, and 38.6% carbohydrates. Numerous research reports have appeared its nutritional and medicinal properties over the past decades. Different reports show that due to its multipurpose uses *Moringa* tree has recently got attention in different countries. It is a super food because of all its parts are used for nutritional and pharmacological properties. The most amazing fact about *Moringa* is that it is a storehouse of nutrients and medicinal chemicals (Jongrungruangehok et al., 2016 and Moyo et al., 2011). It has been shown that *Moringa oleifera* (whole plant) has high protein compared to with other plant eaten as food. It has great potential for prevention of diseases like nutrient deficiency. *Moringa oleifera* has also been promoted by World Health Organization (WHO) as an alternative to important food source to treat malnutrition (Sutalangka et al., 2013). This study provides a brief overview about multipurpose uses of *Moringa oleifera* tree and its implication for malnutrition and human health cure. This type of study can prove to be beneficial in human health along with solving the problem of malnutrition in M.P and other states.

Key words: *Moringa oleifera*, Malnutrition, Human health, Nutrient deficiency, Food supplements.

Amla (*Phyllanthus Emblica*) Uses For The Sustainable Health Care.

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Amla (*Phyllanthus emblica*) is well known plant with medicinally important fruit because rich in nutritional properties as well as medicinal also. It is known as names as amrita, amalki, amritphal etc. since ancient times. Amla is good source of vitamin C. its most popular name is AMLA. It is know by different names depending on its usefulness and properties. Amla tree is a high bushy plant, its stem is bent and 100 to 150 cm thick, the fruit is divided into 6 buds, the fruit are green smooth and pulpy it's belonging to phyllanthaceae family. Scientific names is emblica ophisinailish, Indian gooseberry, emblic myrobalan etc. *Phyllanthus emblica* contains phytochemicals including fixed oil, phosphatides, essential oil, tannins, minerals, vitamins, amino acid, fatty acid, glycosides etc. various pharmaceutical potentials of *Phyllanthus emblica* have been previously reported including antimicrobial, antioxidant, anti inflammatory and this traditional used as – anti cancer (antioxidant properties are found which kill cancer cells inhibits development) and peptic ulcer, reducing weight loss, liver disease, nose bleeding, relief in infertility, diabetes etc.

Dynamic Of Endophytic Fungal Diversity Of Medicinal Plant *Butea Monosperma* Stem In Different Locations.

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Abstract - This study given an idea of the endophytic fungi of *Butea monosperma* (Lam.) stem. This plant commonly known as “flame of forest”. In this study the leaf explant was collected from two different locations (loc 1- Satna and loc 2- Allahabad). There were 57 endophytic fungi isolated from 300 healthy stem segment. Isolated endophytic fungi representing 06 different taxa identified as *Alternaria alternata*, *Alternaria sp.*, *Cladosporium sp.*, *Aspergillus flavus*, *Aspergillus niger*, *Curvularia sp.*, and 08 different morphotypes with sterilia mycelia. *Cladosporium sp.* was the dominant endophytic fungus. The total colonization frequency of stem was 19.00%. The statistical analysis was revealed that species richness (S) was 8, dominance (D) was 0.18, and Simpson (1-D) was 0.82, Shannon (H) was 1.878 and evenness was 0.8172 in the stem segment. The stem of *Butea monosperma* was good in endophytic fungal diversity. *Butea monosperma* has great medicinal properties reported as antibacterial, antifungal, antiviral, antidiabetic, antidiarrhoeal, anthelmintic, anticancerous, antioxidant, immunosuppressive and many more traditional uses by locals. Medicinal properties may be associated with the diversity of endophytic fungus which considered as source of novel bioactive metabolites. These metabolites may be enhanced the medicinal property of respective plant.

Floral Waste Management and its Utilization in Value Added Products

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Solid waste disposal is major problem in the world; flower waste is an integral part of this floral waste is one of the major concerns. However, like any other natural solid waste floral waste can be technologically improvised on, converting it to value-added. Degradation otherwise is a very slow process and it causes a massive hazard to wellbeing of our surroundings primarily soil and water. Therefore, there is a need of proper and eco-friendly process for floral waste degradation. Looking into the harmful impact of the improper disposal of wastes on the environment and the slow degradation of these wastes, emphasis should be given on how we can transform this waste to wealth, by their utilisation in diverse sectors, ranging from agriculture to various other industries, creating various value-added products that can help generate livelihood as well.

India is a country with lots of different religions where, worshipping is the way of living and people offer various offerings to the deities, out of which floral offerings are found in huge quantity. Therefore, temple waste has an exceptional share of flower waste in the total waste. After gratifying their purpose, flowers along with other waste, find their way into the garbage or are discarded into river, sea or oceans causing various environmental problems. The majorly offered flowers in temples are marigold, rose, jasmine, chrysanthemum, hyacinth, hibiscus, etc. This floral waste can be properly managed and utilized in various value added form. Techniques like vermicomposting, composting, dyes extraction, extraction of essential oils, making of Holi colours, dry flower technology and bio-gas generation can be used. As most of the flower contains secondary metabolites which can be further used in essential oil extraction and food additives. Handmade paper can also be made by utilizing these waste products are important application of floral wastes which, helps to cope up with energy crises and environmental pollution.

Key words:- Floral waste, value added products, temple waste, vermicompost.

Biochemical Studies on the impact of a combination of pesticides on cat fish, *Heteropneustes fossilis*

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In the present study, the acute toxicity of combination of an organophosphate (Chlorpyrifos) and a pyrethroid, (Cypermethrin) was estimated for 96 h in *Heteropneustes fossilis* and found to be 0.0476 mg/L. To assess its sub-lethal effect, fishes were exposed to 5% and 10% of LC 50 of this combination for 96 h. Significant variation in morpho- behavioural changes, specific activity of various stress marker enzymes (SOD, CAT, GST) and levels of lipid peroxidation (LPO) & reduced glutathione (GSH) were observed following exposure of low and high sub-acute concentration of this combination in *Heteropneustes fossilis*. Such changes indicate potential health risk to both; the fishes and humans due to accumulation of these pesticides through aquatic ecosystem and food chain.

Boerhavia diffusa Linn. “An Herbal Remedy for Sustainable Human Health”

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The Indian subcontinent is endowed with a rich expertise in local health traditions. The traditional medicine in India functions through two social streams. One is local folk stream, which is prevalent in rural areas of India. The second level of traditional health care system is the academic system. Now in recent era developing nations like India uses plant based medicines for health care since time immemorial. But, since past few decades resurgence of interest in green products in the industrialised countries has a huge market for plant based products. It is great surge in use of medicinal plants as a source of drugs which has been met by indiscriminate harvesting of the flora. A recent assessment has brought into notice around 200 Red lists medicinal plants which can be used for the saving lives & livelihoods. Therefore in order to maintain a sustainable supply of the raw materials from the forests, conservation of biodiversity and sensible use of available medicinal plants like *Boerhavia diffusa* should be encouraged. *Boerhavia diffusa* has a long history of uses in Ayurvedic or natural herbal medicines. The plant is used in epilepsy, pain in abdomen, dysentery, pneumonia, jaundice, anaemia, as blood purifier, in enlargement of spleen, as stomachic, emetic, laxative, expectorant, diuretic, astringent, antiasthmatic, as anti-inflammatory tonic, in urinary troubles, ascites, uterine bleeding, in liver complaints, heart diseases, in dropsy, gonorrhoea, oedema, as diuretic, in haemorrhoids, colic, constipation, as antidote to rat bite poison, in rabies, oliguria, as antidote to snake bite & for liver ailments. This study would be useful for the confirmation of medicinal values of *Boerhavia diffusa* through pharmacology.

Keywords: Medicinal Plants, Anti-inflammatory, traditional health care, indiscriminate, *Boerhavia diffusa*.

Economic Attributes of C2 Breed of Eri Silkworm Reared on Different Castor Genotypes

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Eri silkworm (*Samia cynthia ricini*) is most exploited, multivoltine, domesticated and commercialized non mulberry silkworms. Eri silk production and productivity depends highly on feeds consumed by eri silkworms. A study was undertaken to evaluate different castor genotypes (GCH 4, DCH 519, TMV 5, GCH 5 and Local variety) on the rearing performance of C2 breed of eri silkworm. The treatments were laid out in a Completely Randomized Design (CRD) with four replications. The economic performance of eri silkworm was studied by feeding them with the leaves of different castor genotypes and locally available castor variety. The genotypes showed significant differences among economic parameters, viz., Larval weight (g), Larval duration (days), Silk gland weight (g), SGTSI (%), Cocoon weight (g), Shell weight (g), Cocoon yield (kgs), Shell Ratio (%), ERR (%), Silk Productivity (%), Sericin and fibroin content (%) and grainage parameters, viz., Egg hatchability (%), Fecundity (nos.) of C2 breed of eri silkworm. Among the five genotypes, GCH 4 and DCH 519 genotypes showed superior among all the other genotypes on economic parameters. This study reveals that of the five castors genotypes, GCH 4 cultivation would be more beneficial to the castor farmer for ERI culture as it yields more after local castor variety.

Keywords: C2 breed, Castor genotypes, Rearing and Grainage parameters.

“A study on the biological effects of some plant extract on growth regulation in Mosquito *Aedes aegypti*”

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Mosquitoes are the factors of many pathogens that continue to make many types of large impact in human health and disease. The biological and larvicidal activity of Indian medicinal plants *Azadirachta indica*, *Cascabela thevetia* and *Datura* these selected plants extract used on growth regulation again *Aedes aegypti* mosquitoes. The present study will also be helpful to promote research in the field of mosquitoes controlling agents and they provide ecofriendly and safe method for control mosquitoes vectors, many chemicals they are N-Hexane, Methanol, Ethanol and Chloroform are used in plant extract proved effective on *Aedes aegypti* mosquitoes. More study assessment of the larvicidal and cytotoxic effect of the extract of select plants against the larval stage of *Aedes aegypti* mosquitoes for under laboratory condition.

KEYWORD: Medicinal plants, N-Hexane, Methanol, Plant extracts, *Aedes aegypti* mosquitoes

Health Status of Women and Case Study on Urinary Tract Infection among Females of Reproductive Age in Satna Madhya Pradesh:

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Urinary tract infection is a general bacterial infection that affect various part of the urinary tract system .urinary tract infection is one of the most common infection among Indians. Majority of the infections involve the lower urinary tract – the urinary bladder and the urethra. Women of reproductive age group (18-44 years) are the most vulnerable of developing UTI than men. The objective of this study is to determine the prevalence rate of UTI among females of reproductive age group and to ascertain the association between socio demographic factors among study population. For the present study Sardar Vallabhbhai Patel District hospital Satna and two private hospitals were selected. Present work has been undertaken with the broader methodological framework of health status which involves both primary and secondary data, collected by survey methods from, general gynae OPD and outdoor. Results concluded that this study focuses on the major factors responsible for UTI and awareness of reproductive health infections. The present research work suggests the researchers in the field of women health to bring various researches for safeguarding the women health status as whole.

The Impact of Atmospheric Pollutants on Human Health at Satna City

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Air pollution is the contamination of atmosphere by gaseous, particulate and biological molecules or by-products. The impact of pollution on human health is becoming increasingly severe and loss of environment. it is the contamination of surrounding chemical activities, physical activities and biological agents. EPA (Environmental Protection Agency) has set national air quality standards for six criteria pollutants: ground level ozone, carbon monoxide, nitrogen dioxide, sulphur dioxide, particulate matter and lead. Short and long term exposure to suspended pollutants has various adversely impacts on human health including respiratory infections, asthmatic attacks, cardiovascular diseases, neuropsychiatric complications, skin diseases, eyes irritation, and long term chronic diseases such as cancer. We will calculate the daily concentrations of major air pollutants (including PM 10 , PM 2.5 , SO₂ , O₃ , NO₂ , and CO) and the daily air quality index (AQI) values according to (CPCB) Central Pollution Control Board norms. These data cover the area of Satna city from different location and we will find the result which pollutants are producing the relative risks (RRs) of the human health.

Biodiversity beyond Protected Area: A Paradigm Shift in Biodiversity and Conservation

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Biodiversity is the key indicator of healthy planet and healthy society. Richness of biodiversity is essential for maintaining variety, variability of life and associated ecological process. India is far too diverse in biological terms and contributing 8% to the world's biodiversity through 2.4% of world's geographical area. Protected area and natural reserve forest area the major centers of biodiversity. Increasing population threatens biodiversity by habitat loss, habitat fragmentation, and formation of isolated landscapes. These fragmented/isolated patches of also good repository of regional biodiversity. There are several constraints in bring the entire range of biodiversity under network protected areas and challenges to manage them. A paradigm shift is needed, to visualize purposes of conservation beyond protected areas network, to record biodiversity of selected faunal groups on to large landscapes. There are several categories of landscapes under the control of government and non-organizations, academic and defense institutions etc. A study conducted in Mizoram University campus to explore different faunal groups such as mammals, birds, reptiles, butterflies, and spiders to evaluate the biodiversity richness is presented with conservation suggestions. Highlight of this study indicated presence of endangered and schedule species from some of groups.

Water Pollution Impact on Microalgae of Kali River, Meerut (U.P.), India

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The pollution in water bodies is a serious problem in different countries and it severely affects the growth and health of living organisms including human beings. The main source of the water pollution is the waste materials and industrial effluents which are discharged by a large numbers of Industries and Municipal corporations of different cities located in the vicinity of natural water resources. The most of the mega cities of the country including Delhi, Kanpur, Prayagraj, Varanasi and Lucknow are located on the river banks of major rivers of India including Ganga, Yamuna, Gomati, and many other cities including Saharanpur and Meerut are located on the river banks of the their tributaries like Hindon and Kali river and they release a wide range of toxic pollutants and different types of organic wastes which reach to the major rivers of the country and cause pollution in these natural water resources. The Kali River is one of the highly polluted rivers of the western Uttar Pradesh of India and it flows through the Meerut city. A large number of industries including food, pharmaceuticals, textiles, metals, dairy industries and municipal corporations are discharging wastes into the Kali river which severely influence the growth of the organisms including microalgae. Present communication deals with the microalgal flora of the Kali river. The present study revealed the occurrence of 279 strains of 48 species and 12 genera belonging to different groups of microalgae including blue-green algae, green algae, diatoms and euglenoids. The study also revealed that unicellular forms are dominant among blue-green algae in highly polluted water stream of Kali River, Meerut.

Keywords: Biodiversity, Microalgae, Pollution, Waste, Water

Management of an Exotic Weed, *Parthenium* in Chitrakoot, Satna MP

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Parthenium is a major biotic constraint in agricultural production systems worldwide. Besides reducing crop yield and quality, this plant adversely affects the biodiversity, animal health and environmental security. Weeds interfere with normal plant growth by competing for available nutrients, light and water. It forms predominant exotic vegetation by replacing native Flora. *Parthenium* weed degrades the natural ecosystem due to very high invasive capacity and allelopathic properties. The weed has high reproductive capacity 15000 light weight seeds/plant, which disseminate fastly by wind, rain and traffic activity. In India, It has spread all over India covering most of the vacant and marginal lands. Within last century it has been reported from more than 54 countries including India and become a very serious problem in our country. About 35 million hectares land is infested with *Parthenium hysterophorus*. The several methods are being used for the management of *Parthenium* like Uprooting and Burning, Chemical herbicides, Eucalyptus oil, Leaf eating beetle, Stem galling moth, Stem boring weevil and Fungi etc. In the present study *Zygogramma bicolorata*, a leaf eating beetle is used. Defoliation of *P. hysterophorus* by *Z. bicolorata* in and around Chitrakoot has caused an overall reduction in flower production by the weed, which in turn has reduced its pollen density in the atmosphere. Among many control methods of *P. hysterophorus*, the biological control is one of the most promising, suitable, cost-effective and environmentally-safe method.

Keywords: *Zygogramma*, Gajar Ghas, Beetle, Biological control

Measurement of Cortisol hormone and its effects on haematological Indices in *Mystus bleekeri*

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Stress is an increasingly studied topic in teleosts because of its interactions with development, reproduction, the immune system and ultimately the fitness of the animal. Whether it is to evaluate welfare in aquaculture, adaptive abilities in fish ecology, or to investigate the effects of humaninduced rapid environmental change, stress physiology in captive or wild fish is important to describe. New experimental methods have emerged. Cortisol has been shown to be a reliable indicator of stress and is considered the major stress hormone. Initially primarily measured in blood, cortisol measurement methods are now evolving toward less invasiveness and allowing repeated measurements over time. We measure cortisol in *Mystus bleekeri* in summer and winter by new alternatives to blood, whole body and eggs as matrices for cortisol measurement, specifically mucus, faeces, water, scales and wing. We also studied effects of the different level of cortisol hormone in haematological indices.

Keywords: Stress, Cortisol, Hematology, aquaculture

Biochemical Studies on the impact of a combination of pesticides on Cat fish, *Heteropneustes fossilis*

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In the present study, the acute toxicity of combination of an organophosphate (Chlorpyrifos) and a pyrethroid, (Cypermethrin) was estimated for 96 h in *Heteropneustes fossilis* and found to be 0.0476 mg/L. To assess its sub-lethal effect, fishes were exposed to 5% and 10% of LC50 of this combination for 96 h. Significant variation in morpho-behavioural changes, specific activity of various stress marker enzymes (SOD, CAT, GST) and levels of lipid peroxidation (LPO) & reduced glutathione (GSH) were observed following exposure of low and high sub-acute concentration of this combination in *Heteropneustes fossilis*. Such changes indicate potential health risk to both; the fishes and humans due to accumulation of these pesticides through aquatic ecosystem and food chain.

Effect of Soil Moisture on Diversity of Herbs for the Conservation of Riparian Zone in the Central Region of Narmada

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The distribution, variety, and primary production of plant communities are all strongly correlated with the availability of soil water. Due to some anthropogenic activities, the vegetation cover near the water bodies (i.e. riparian zone) was affected which may be the result of the unavailability of soil water and other soil components. So, to improve the vegetational health of riparian zone it is necessary to evaluate the relationship between the vegetation and soil components. Here, we report some findings from a study conducted in riparian forests in central India, where we looked at the vegetational condition of our study area and how soil moisture (SM) affected the variety and composition of herbs in the riparian zone of the central Narmada region. In our study, the Shannon-Wiener diversity index (SWDI), Simpson diversity index (SDI), Margalef's index (MARI), and Menhinic's index (MERI) of species richness of the herbs were assessed in the three seasons (i.e., pre-monsoon season, post-monsoon season, and post-winter season) which showed significant positive relationships with SM. The index of the link between soil moisture and biodiversity (RSDM, or Root-mean-square deviation, or RSDM), which measures soil moisture at 0–12 cm depth, shows that only this association increased with the change of season. In the pre-monsoon season, the Shannon Wiener diversity index (SDI)'s linear relationship with soil moisture was stronger than that of other indices, despite MARI and MERI exhibiting stronger linear correlations with soil moisture in the postmonsoon and post-winter seasons, respectively (SM). Therefore, while developing reforestation initiatives for the tropical forest, the species' response to changes in SM should be adequately examined. Keywords: Riparian vegetation, diversity index, soil moisture, conservation

Present Status of River Bodies of Bhojpur (Bihar), India applying Overall Index of Pollution, Comprehensive Pollution Index and Water Quality Index Model

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The present status of the River Ganga, Sone and Gangi in Bhojpur (Bihar), India using the Overall Index of Pollution, Comprehensive Pollution Index and Water Quality Index was assessed from November 2017 to October 2019 using 648 water samples and 9 sampling sites. Eleven water quality parameters, viz. temperature, pH, dissolved oxygen, total alkalinity, total hardness, total dissolved solids, chloride, nitrate, biochemical oxygen demand, sulphate, fluoride were measured using standard methods for winter, summer and monsoon seasons. Two way ANOVA revealed significant spatial and temporal differences between these water bodies. The numerical equations to convert the actual concentration values into pollution indices were used. Values (1.85 to 2.07) of the overall index of pollution indicate that the water of these rivers falls into Class 2 (acceptable) to 3 (slightly polluted). The scores (0.76 to 0.82) of the Comprehensive Pollution Index indicated category 3 (slightly polluted) water. The overall water quality index (182.0 to 263.7) also indicated that the water is poor or very poor. The results showed that dissolved oxygen, total alkalinity, fluoride, and, in rare cases, biochemical oxygen demand were higher than the BIS (2012) standard limits, indicating that water quality degradation had occurred in the river body. The observations revealed that agricultural waste runoff, anthropogenic activity and the entry of untreated sewage were the main contributors to the decrease in water quality in these bodies. As a result, the water quality of these bodies made people feel the need to adopt proper management policies and conservation efforts for these river bodies in the future.

Keywords: River bodies, seasonal values, the overall index of pollution; comprehensive pollution index, water quality index, physicochemical parameters, India.

Current Status of Biodiversity and Future Strategies

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Biological diversity is of fundamental importance to the proper functioning of all natural and manmade ecosystems and by that logic to human society. Living organisms play a key role in the cycles of major elements and water in the environment and the diversity is of vital importance as these cycles require numerous interacting species. From the human perspective, from common drugs to possible cures for cancers and other life-threatening diseases, most of our medicines come from plants. Biodiversity also holds the key to progress in agriculture, forestry and other fields. So, the costs associated with our deteriorating or vanishing ecosystems will be very high. Yet, the pressures to destroy habitats for commercial exploitation or for alternative uses such as road building are making conservation a struggle. Species are now becoming extinct at an alarming rate. While things may look dire but there are solutions. It may be a tough challenge to conserve and sustain the ecological balance of our environment, but we have to bear in mind that the ecological value of our natural environment far outweighs its economic value and has to be properly worked on for future generation. This paper is therefore aimed to provide a complete picture of the status of biodiversity of the central India with special insights about the species richness, the pressures they face, and various strategies in place for their conservation.

Keywords: Biodiversity, Conservation, ecological balance, species richness.

Role of Organic Farming in Sustainable Vegetable Production in India

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Organic farming is a production system which avoids or largely excludes the use of synthetic fertilizers, growth regulators and livestock feed additives. "The philosophy is to feed the soil rather than the crops to maintain soil health. "In India, majority of the vegetable growers are poor, small and marginal farmers. Decrease in land productivity due to ever-increasing use of chemical fertilizers. Very low cost of production is required in organic farming. Export preference of organic vegetables offers a great scope to a country like India, which has inculcated the skill of growing organically since time immemorial. In developing countries like India, properly managed organic farming system can increase the crop productivity and restore the natural base. Steps for organic vegetable production are timely preparation of soil to a fine tilth with 2 to 3 ploughings, however, minimum tillage is considered an important component of organic farming. Use of organic manure as basal dose @ 25-38 t/ha through FYM, poultry manure, sheep manure etc. and organic cakes from Neem, groundnut, castor and Pongamia (Karanj). Farmyard manure, Sheep manure Neem oil cake; Growing green manure crops like dhaincha (*Sesbania rostrata*), sunnhemp (*Crotalaria juncea*), cowpea (*Vigna unguiculata*) and cluster bean (*Cyamopsis tetragonoloba*), and incorporating them in the soil. Use of crop residues is essential for increasing soil organic matter content and maintaining soil fertility status. Including legume crops like cluster bean, mung bean, chickpea, pea, cowpea, berseem etc. in crop rotation increases the crop yield up to 30-35% ; Vegetable varieties should be selected according to climate of the growing region and market preference. The role of vegetables in nutritional security is immense, hence the production of vegetables need to be increased. Under the present scenario of global warming and climate change, organic farming has the twin objective of sustainability and environmental protection. Organic farming, especially of vegetables, is gaining momentum worldwide due to increasing awareness and concern on adverse effects of indiscriminate use of chemical fertilizers and pesticides on food quality, soil health, human health and environment.

Technologies for Management of Major Diseases of Sesame

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At present chemical fungicides are the first choice for the farmers to combat diseases because of their easy adaptability and immediate therapy. Due to health risk and pollution hazards by use of chemical fungicides in plant disease control, it is considered appropriate to minimize their use. Since sesame seed and oil are in high demand for export due to their high unsaturated fat and methionine content, focus has been shifted out safer alternatives to chemical fungicides in recent years. Biological control had attained importance in modern agriculture for disease control. Since the efficacy of bio-control agents in disease abatement has been inconsistent due to their inability to maintain a critical threshold population necessary for sustained bio-control activity, bio-control with antagonistic microorganism alone could not be a complete replacement for management strategies currently employed. To enhance and extend the desired response, the addition of specific substrates which are utilized selectively by the introduced microbe employed as biocontrol agent. Therefore, Integrated Disease Management (IDM) that incorporates the biocontrol agents, botanicals and organic amendments would reduce the number of fungicides used per season in addition to combat diseases in an economically viable and ecologically safe proportion. Among the many production constraints, the most important include lack of improved cultivars and a poor seed supply system. In addition, there are severe biotic stresses, such as root rot /stem rot (*Macrophomina phaseolina*) (Tassi) Goid, (Bacterial blight (*Xanthomonas campestris* pv. Sesame), Phyllody (a Mycoplasma –like organism), Powdery mildew (*Oidium erysiphoides*), Alternaria leaf spot (*Alternaria sesame*) and Cercospora leaf spot (*Cercospora sesame*). Sesame diseases cause damage to seed, seedling, root, stem as well as foliage resulting in significant loss. The use of Eco-friendly pest control method has got tremendous scope since the diseases are controlled without putting any threat to the quality of produce and surrounding ecosystem. Major diseases, their characteristic symptoms and control measures recommended for their eco-friendly management. Seed treatment with *T. viride* @ 10 g/kg, furrow application of enriched *T. viride* (2.5 kg in 100 kg of FYM) @ 250 kg/ha followed by two foliar spray of combo-product (Tebuconazole 50% + Trifloxystrobin 25%) @ 0.5 g/l was found and economical for the management of root & stem rot, Alternaria leaf spot, Cercospora leaf spot and powdery mildew of sesame.

Detection of Citrus Yellow Mosaic Virus & Citrus Greening Bacterium by duplex PCR

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A method of duplex polymerase chain reaction (PCR) was developed for the simultaneous detection of Citrus yellow mosaic virus (CYMV) and citrus greening bacterium, *Candidatus Liberibacter asiaticus* (CLa) from citrus trees. Initially total DNA from individual CLa and CMBV infected citrus plants were mixed infected field sample for both pathogens were detected by Multiplex PCR. Using multiplex PCR two different fragments of 1024 bp and 451 bp specific to CYMV and CGB respectively were simultaneously amplified. The consistent result of multiplex PCR was compared with Simplex PCR for detection of each pathogen. The Multiplex PCR method developed in the present investigation proved to be highly sensitive, economic and reliable methods for detection of citrus greening bacterium (CGB) and the Citrus yellow mosaic virus (CYMV) in citrus trees from the orchards. The technique should prove highly useful in disease surveys, nursery certification and quarantine applications.

Soil Health Monitoring and Management Practices

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Soil health assessments are tools that can be used to integrate knowledge about and social interest in soil resource sustainability. Appropriate interpretation of soil health assessments requires robust databases of soil properties and their variation across large regional areas. This analysis explored field-scale spatial and temporal variation in 16 soil health indicators used in common soil health assessments. Relationships among management, environment, and measured soil properties were examined using various combinations of correlation, principal component analysis (PCA), and multiple regressions. Specifically, variability was evaluated using the temporal average of indicator lab test values, the temporal and spatial coefficient of variation (CV), and corn (*Zea mays* L.) and soybean (*Glycine max* L.) yield variation. Solvita had the highest spatial and temporal CV, while organic matter (OM), autoclaved citrate extractable protein (ACE), and pH had the lowest spatial and temporal CV values. The PCA analysis identified climate, soil texture, organic C and N pools, and soil water availability as factors that accounted for variation in soil health indicator values. Multiple regressions showed that climate variables and field conditions strongly affect corn and soybean yield variation. Solvita, OM, and available water content improved corn and soybean yield variation estimates. These results show that considering spatial and temporal variation when monitoring soil health changes may improve soil health assessment interpretation.

Keywords: Soil Security; Soil health; Indicators; Variation

Present Status of River Bodies of Bhojpur (Bihar), India applying Overall Index of Pollution, Comprehensive Pollution Index and Water Quality Index Model

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The present status of the River Ganga, Sone and Gangi in Bhojpur (Bihar), India using the Overall Index of Pollution, Comprehensive Pollution Index and Water Quality Index was assessed from November 2017 to October 2019 using 648 water samples and 9 sampling sites. Eleven water quality parameters, viz. temperature, pH, dissolved oxygen, total alkalinity, total hardness, total dissolved solids, chloride, nitrate, biochemical oxygen demand, sulphate, fluoride were measured using standard methods for winter, summer and monsoon seasons. Two ways ANOVA revealed significant spatial and temporal differences between these water bodies. The numerical equations to convert the actual concentration values into pollution indices were used. Values (1.85 to 2.07) of the overall index of pollution indicate that the water of these rivers falls into Class 2 (acceptable) to 3 (slightly polluted). The scores (0.76 to 0.82) of the Comprehensive Pollution Index indicated category 3 (slightly polluted) water. The overall water quality index (182.0 to 263.7) also indicated that the water is poor or very poor. The results showed that dissolved oxygen, total alkalinity, fluoride, and, in rare cases, biochemical oxygen demand were higher than the BIS (2012) standard limits, indicating that water quality degradation had occurred in the river body. The observations revealed that agricultural waste runoff, anthropogenic activity and the entry of untreated sewage were the main contributors to the decrease in water quality in these bodies. As a result, the water quality of these bodies made people feel the need to adopt proper management policies and conservation efforts for these river bodies in the future.

KEYWORDS: River bodies, seasonal values, the overall index of pollution; comprehensive pollution index, water quality index, physicochemical parameters, India.

Effects of Chromium on vital functioning and behavioural anomalies of a freshwater catfish, *Heteropneustes fossilis*

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Chromium, a heavy metal, enters the aquatic ecosystem through industries such as - electroplating, polishing, paint, rubber, plastic, ceramics, fiberglass, chrome plating, chrome alloy making, welding and foundries. It exists in several valance states but only trivalent (Cr+3) and hexavalent (Cr+6) are biologically significant. Trivalent chromium plays a role in glucose and lipid metabolism. Hexavalent chromium is most toxic to mammals and fish, and is known to cross biological membranes with relative ease as compared to trivalent chromium. Hexavalent chromium damages the osmoregulatory and/or respiratory system of fish. The significant accumulation of Cr+6 is typically more widespread in gill, kidney and intestine, causing histopathological changes in these tissues and altering the carbohydrate metabolism. The hexavalent chromium also causes remarkable changes in the behaviour of the fish, *Heteropneustes fossilis*. Which were expressed as increased opercular movement, sluggish, lethargic and abnormal swimming, loss of buoyancy and muscular-tetany. The exposed fish also showed fading of their body colour.

Cadmium Chloride Induced Behavioural Anamolies in Freshwater Prawn, *Macrobrachium Lamarrei* (Crustacea- Decapoda)

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Heavy metals are considered as major source of environmental pollution. Metal contamination is typically derived from different sources like mining, industrial effluent, sewage etc. Cadmium, a 'Black listed metal' is unique among the other metals because of its toxicity at a very low concentration, long half-life period, bioaccumulation, biomagnification. Freshwater prawn *Macrobrachium lamarrei*, is a potential candidate for freshwater aquaculture as well as a well suited lab model for environmental monitoring. *M. Lamarrei* were subjected to static bioassay test shared LC50 0.28 mg/ml, 0.21mg/ml, 0.17mg/ml, 0.12mg/ml, 24, 48, 72 and 96hrs respectively. LC50 showed inverse relationship. The prawns showed initial hyperactivity, profused mucous secretion, increased scaphognathite oscillation, increased fighting encounters change in colouration, and blackening of gills in very few animals was seen. After 96hrs showed lethargic behavior and finally succumbed to death. The behavioural alterations of Prawn showed the most susceptible and foremost indication of potential toxic effects. Present study indicates that behavioural parameters, especially being non invasive, can serve as better biomarkers for cadmium toxicity and monitoring of surface and drinking water quality.

Keywords: Behavioural toxicity, Cadmium, Freshwater Prawn, *Macrobrachium lamarrei*

**Copper Sulphate Toxicity to Freshwater Prawn, *Macrobrachium lamarrei*
(Crustacea- Decapoda)**

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Heavy metal pollution is caused by natural as well as anthropogenic activities which are of global concern now days. Copper, “a gray listed” heavy metal, despite being an essential micronutrient becomes highly toxic when present in excess quantity. There by adversely affecting aquatic flora and fauna. CuSO₄ is widely used as weedicide in aquaculture pond therefore, proper standardization of dose becomes necessary. *Macrobrachium lamarrei*, small freshwater prawns, were subjected to static bioassay tests showed LC₅₀ values as 0.36, 0.32, 0.28 and 0.25mg/l for 24, 48, 72 and 96hrs respectively. LC₅₀ show inverse relationship. Prawn showed behavioural alterations like initial hyperactivity thereby reduced swimming and appendage movement, loss of equilibrium, increased surfacing, darkening of cuticle, increased mucus secretion in gills and whole body and finally intense letharginess. Food consumption was found reduced mainly due to detection of food. Behavioural parameters are foremost indicator of physiological damage, being non invasive they can serve as better biomarkers for metallic pollution and monitoring of surface and drinking water quality. Fresh water prawn, a potential candidate for freshwater aquaculture, can also serve as better bio-indicator of Cu toxicity. Findings of present investigation will also be helpful for freshwater aquaculture practices.

Keywords: Behavioural alterations, Copper toxicity, Freshwater prawn, *M. Lamarrei*

Acoustic Analysis of Squirrels (*Funambulus pennantii*) in Chitrakoot, U.P.

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Call is an important part of animal behavior. Animal sound classification and retrieval is very helpful for biologists and audio retrieval application. A very few investigations has done in acoustic analysis of vocalization of squirrel (*Funambulus pennantii*). The present study focused on acoustic analysis of Squirrel (*Funambulus pennantii*). The study was conducted in Chitrakoot during summer season. Study was carried during period of March and May 2022. Vocal sounds were recorded with mobile sound recorder and analyzed in computer with sound analyzing software PRAAT With caller's age, sex, social status and reproductive state as well as with particular features of caller's environment. Six vocal sound of Squirrel were recorded and analyzed: food competition, morning chirping, happy chirrup call, panic anxiety call, grunt sound and sound of defending territory. Thus acoustic analysis is helpful to know animal behavior and save them from their extinction because of environmental changes and anthropogenic activities.

Key words: Acoustics, animal behavior, environmental changes.

Chitrakoot region tribes: A knowledgeable hub of age old native Medicinal Flora

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Chitrakoot of Madhya Pradesh is famous for the age-old medicinal floras by the tribes of native place. A survey was conducted by face to face meeting with the tribes of Chitrakoot region and found about 103 plant species including 32 trees, 14 shrubs/under shrubs, 46 herbs and 11 climbers belonging to 45 families. They use these plant extract in fever, wound, cuts, constipation, eye disease, skin problems, jaundice, asthma, joints pain, diarrhea, stomach disorders, liver problems, digestive problems, cough, cold etc. They also use these plants as antidotes of insect and snake venoms. The indigenous knowledge of tribal group of Chitrakoot region e.g. Kol, Mawasi, Baheliya etc. playing a proficient role on controlling diseases and saving lives. The present study was carried out to get the information regarding the parts of plant, formulation, dose and the time of medicine provided to the patients by the tribes of Chitrakoot region. In the study some undocumented medicinal plants were also revealed.

Some Specific Behaviour of Highly Provisioned Focal Troops of Rhesus Macaque and Hanuman Langur at Pilgrimage Areas.

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The rhesus macaque (*Macaca mulatta*) and Hanuman langur (*Semnopithicus entellus*) are one of the well known non-human primate species of old world monkeys. The artificial feeding of Rhesus macaque and Hanuman langur in pilgrimage areas usually leads to change in behavioural strategies, individual activity and physical growth rate etc. The variability in the frequency of provisioning directly affects the ranging of particular troop. Troops showed a well marked home range with certain degree of defense mechanism. During the present investigation data on specific behaviour were obtained and correlated with each other. The present paper suggests recommendations to improve the present situation of Rhesus macaque (*Macaca mulatta*) and Hanuman langur (*Semnopithicus entellus*), their eco-behavioral and conservation in different location of pilgrimage places.

Key words: Rhesus monkey, Hanuman langur, eco-behavioral

The Global Potential for Renewable Energy

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World energy demand is projected to rise to 1000EJ ($EJ=10^{18}J$) or more by 2050 if economic growth continues its course of recent decades. Both reserve depletion and greenhouse gas emissions will necessitate a major shift from fossil fuels as the dominant energy source. Since nuclear power is now unlikely to increase its present modest share, renewable energy (RE) will have to provide for most energy in the future. This paper addresses the questions of what energy levels RE can eventually provide, and in what time frame. We find that when the energy costs of energy are considered, it is unlikely that RE can provide anywhere near a 1000EJ by 2050. We further show that the overall technical potential for RE will fall if climate change continues. We conclude that the global shift to RE will have to be accompanied by large reductions in overall energy use for environmental sustainability.

Key words: Climate change, Energy analysis, Environmental constraints, Technical potential and Renewable energy.

Identification of Suitable Sites for Water Conservation Structures Remote Sensing and GIS

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Formulation of a proper watershed management plan requires reliable and up - to - date information about various factors such as morphologic (size and shape of the watershed, drainage parameters, topography), soil and their characteristics, land use, and land cover, etc. that affect the behaviour of a watershed. Satellite based remote sensing technology and Geographical Information System (GIS) meets both the requirements of reliability and speed and are ideal tools for generating spatial information needs. In this study, a locale - specific watershed development plan was generated for the case study area of a small watershed of Chitrakoot, India using remote sensing and GIS techniques. Indian Remote Sensing Satellite (IRS - 1C), Linear Imaging Self Scanner (LISS - III) satellite data along with other datasets, e.g. existing maps and field observation data have been utilized for generating a land use/land cover map and to extract information on morphological parameters (bifurcation ratio, elongation ratio, drainage density, ruggedness number, relief ratio, and circulatory ratio) and other thematic maps which are an essential prerequisites for watershed development. Morphological parameters of sub watersheds were derived to understand its usefulness for surface water development. The conceptual framework for plan and site suitability mapping for water conservation structures is developed and subsequently, these parameters were integrated with other thematic information viz., land use/cover, drainage, slope, and soil in the GIS environment to arrive at a decision regarding a suitable site for having soil and water conservation structures (nala bund, check dam, and percolation tank) in its place adopting a holistic approach.

Key words: Remote sensing, GIS, Water conservation

Cynobacterial Biodiversity of Rice Fields of Satna District of Madhya Pradesh

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The blue green algae or Cyanobacteria is one of the most primitive group of living organisms. The present study deals with the diversity of blue green algae in rice fields of Nagod and Amarpatan tahsil of Satna District. These blue green algae found here provide a boost to rice production. Twenty nine species of Blue green algae were identified in different localities of Nagod and Amarpatan tahsil of Satna District. Out of these *Anabaena*, *Aphanocapsa*, *Coloeocapsa*, *Lyngbya*, *Nostoc*, *Oscillatoria*, *Phormidium*, *Spirulina* etc. are the major species of blue green algae. Wide spread distribution of Cyanobacteria reflects a large variety of species covering a broad spectrum of morphological characteristics

Cyanobacteria (BGA) are also characterised by great morphological diversity; unicellular as well as filamentous species being included with a cell volume ranging over more than orders of magnitude. Morphological characteristics of these different forms of Cyanobacteria dealt with details of morphological configuration helpful in algal characterisation.

Ichtyodiversity of Shahpura dam, Kothi District Satna (M.P.)

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Abstract: : Fishes are valuable sources of high grade protein and other organic products. They occupy a significant position in the socio-economic fabric of any country by providing the population not only the nutritious food but also income and employment opportunities. The present paper deals with the study of diversity of fishes at Shahpura dam (Latitude 24° 48' 45" and Longitude 80° 42' 30"). Dam is constructed near Shahpura village of Kothi, Satna district on the Kothiyari river in 1972-1973. This dam is also known as Bhainswar tank the catchment area of the dam is 25.90 sq.km (as per record of Water resource division of Satna). Irrigation was the main purpose for constructing this dam but now it is being used for fish culture by fisheries department of Satna. The fish samples were collected on the monthly basis from November 2020 to October 2022. The Twenty two fish species of the family *Cyprinidae*, *Siluridae*, *Bagridae*, *Clariidae*, *Notopteridae*, *Channidae*, *Mastacembelidae* etc were reported from this Shahpura dam. The observation of fishes from commercial catches and those marketed indicate their wide distribution and availability in good number in Shahpura dam.

Avifaunal Diversity of Satna District Of Madhya Pradesh

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Avian fauna acts as an important bio-indicator and assesses habitat quality and quantity. A brief summary to explore bird population in Satna district of Madhya Pradesh was carried out. For the avifauna study visual and watching survey revealed the presence of 67 bird species belonging to 28 genera and 8 orders. Order Passeriformes was found to be the dominating group. During the surveys, different stress factors were also observed, which are accountable for the habitat degradation and destruction.

Formulation and Standardization of Traditional Herbal Formulation (Kajal) Used for Eye care in Chitrakoot Region, Madhya Pradesh

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Kajal is a folklore herbal formulation which is commonly used as an eye care in all religions of Indian families since ancient times. It is also known as surma or kohl. There are several Muslim and Hindu countries like India, Egypt, Rome, China, Japan, South Asia, Middle east and Africa etc. used many types of cosmetics formulation for beauty, prevention and treatment of numerous eye diseases. In Chitrakoot region Kajal was also applied to newborn babies as well as small children and people for a multipurpose such as an antiseptic, astringent, to improve eye health, and traditions with religious and therapeutic significance. Women prepared different types of Kajal with the help of herbal plants. One is the known as a Belha Kajal in local language. Present study was carried out with the aim of documentation of folklore practices, and preparation of herbal Kajal and its usages by villagers of Chitrakoot region, innovation, and establishment of formulation composition of herbal Kajal and their standardization. For standardization of Herbal Kajal was performed on the basis of various selected parameters like botanical identification, physicochemical parameters, heavy metal screening, HPTLC fingerprint profile and antimicrobial activities were evaluated.

Keywords: Traditional knowledge, Physicochemical, Belha Kajal, Standardization

Role of Phytochemistry in Systematic Identification of Plant Species with Special Reference of *Boerhavia diffusa* Linn.

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Boerhavia species have been of keen interest in phytochemical research due to their excellent medicinal values. In recent time phytochemical studies attend a very significant role in solving problems of systematics. The potential importance of chemical evidences in taxonomy was suggested by a number of early taxonomists. Application of chemical data to systematics was realized after the correlation between medicinal properties and certain morphological groupings in different families. A genuine interest in correlation between plant constituent and classification is relatively recent techniques and availability of comprehensive survey of plant chemistry; taxonomists have shown a great interest in application of chemical characters to the taxonomic problems. Chemical components found in the plant, both the primary and secondary metabolites product have been employed in chemical comparisons of the taxa at various levels. Chemical contributions to the classification of plants are based on their chemical constituents i.e., on their molecular characteristics. Such characters are genetically controlled and have the advantage over morphological characters that they can be exactly described in terms of definite structural and chemical formulae. The method of chemical taxonomy or chemosystematics is thus exact and simple in principle consisting of investigation of distribution of chemical compounds in series of related plants. That's why the chemical characters should be included in a natural classification and every description of a new genus or species should include a short chemical description of that taxon. This study would be useful for the confirmation of positioning the plant species in respective orders.

New dimensions of Restoration of Ecosystems in the Perspectives of Sustainable Goals

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The sustainable development goals mainly stress the fundamental role of science in implementing the 17 Sustainable Goals endorsed by the human community. It mainly implies the research and scientific disciplines must clarify their own ethical values as defines accountability and identification of problems and research questions. We think that ignoring these points whether one in favour or critically of the 2030 agenda, will undermine the credibility and relevance of scientific contribution for sustainable development.

Ecosystem restoration aims to recreate or accelerate the recovery of an ecosystem that has been distributed to human community. If we disturb or deteriorate the ecosystem structure or making change in ecosystem functions, it will affect the human life. Some common disturbances in ecosystems are: making so many dams on rivers, logging activity, intense over grazing natural and manmade hazards like flood and forest fires etc.

We could suggest some restoration techniques for ecosystem like making farmland, developing a freshwater body, by developing eco-friendly urban areas and developing grassland etc. Except these we could also include natural fertilizers and pest control methods, growing more diverse crops etc. These steps can rebuild carbon content in the land making it more fertile. So that our country can feed their growing population easily without using more land.

If we include these techniques of ecosystem restoration this will offer the opportunity to recover the decrease degradation property of nature. This decade relying for protection and reveal the ecosystems all around the world for the benefits of human being and their nature.

Keywords: Restoration, Deteriorate, Disturbances, Farmland, Diverse

Phytochemical screening of *Phyllanthus emblica*, *Terminalia bellirica*, *Cyperus carionsus* and *Chrysopogon zizanioides*

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Plants are bestowed with variety of phytochemical compounds. The extraction of these compounds are used for making drugs due to the presence of medicinal properties against various human and animal diseases or any disorder. Under this aspect, in the present study four medicinal plant species viz; *Phyllanthus emblica* (Amla), *Terminalia bellirica* (Bahera), *Cyperus carionsus* (Nagarmotha) and *Chrysopogon zizanioides* (Khas) have been collected from Chitrakoot (U.P.). The fruit and root were washed, dried in room temperature in shade, grinded into powder and then proceeded for physicochemical characterization and various phytochemical qualitative and quantitative analysis. The results of physicochemical characterization showed highest and lowest moisture content (7.89% and 4.75%) and pH reading (2.55 and 5.59) in the fruits of *P. emblica* and roots of *C. zizanioides* respectively. Distilled water and chloroform extract of all four plants showed good Phytochemical content. The total carbohydrate and protein were found maximum in the fruits of *T. bellirica* and *p. emblica* while reducing sugar and tannin in the roots of *C. scarionsus* and *C. zizanioides* under quantitative analysis respectively. On this basis it can be concluded that all the selected species are very important and share equal status for many medicinal attributes.

Keywords – Plant, Medicinal, Phytochemical, Physicochemical, Qualitative and Quantitative.

Screening of Phytochemicals and Pharmacognostical Investigation of *Moringa oleifera* Leaves Lam.

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Moringa oleifera Lam. (Moringaceae) is a plant with high nutritional and medicinal value. It is now widely distributed throughout tropical and subtropical regions of the world. *Moringa* is well known as the miracle tree due to its high nutritional value and it has many medicinal benefits. The leaves of *Moringa oleifera* were phytochemically analyzed for the presence of phytoconstituents using different solvents. Leaves of *Moringa* are constantly being screened for their phytochemical and pharmacological value because natural drugs obtained from *Moringa* plants are of biological origin. Leaves are used as food having high nutritional value. The leaves are rich in minerals, vitamins and other essential phytochemicals such as alkaloids, flavonoids, saponins, proteins and carbohydrate. The physicochemical analysis explored the loss on drying at 105°C, water soluble extractive value, alcohol soluble extractive value, Total ash value, acid insoluble ash value. The leaves are used to treat malnutrition and human health cure also. It is used as potential antioxidant, anticancer, anti-inflammatory, anti diabetic, and anti microbial agent. The scientific effort of this research provides insights on the use of *Moringa* as a cure for diabetes and cancer. The present communication provides a detailed account of the pharmacognostic evaluation carried out on *Moringa* leaves. The study includes macro and microscopic characters, physicochemical study, fluorescence study, preliminary phyto-chemical analysis and HPTLC fingerprinting aspects. This study will be helpful in the industrial manufacturing of the herbal drugs for treatment of different disease and eradicate the problem of malnutrition in Madhya Pradesh.

Key words: *Moringa oleifera*, physicochemical analysis, phytoconstituents, Pharmacognosy, HPTLC fingerprint.

Study of medicinal plant used by local community in Govindgarh Rewa (M.P.)

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Medicinal plant sector has traditionally occupied important positions in the socio cultural, spiritual and medicinal arena of rural and tribal lives of India. It is an significant source of livelihood opportunities for rural area. India's diversity is unmatched due to the presence of climatic zones. Plant drugs constitute as much as 25% of the total drugs, while in fast developing countries such as China and India, the contribution is as much as 80%. Modern system of medicine and the health care system of rural population depend on indigenous systems of medicine. Today there are more than 7 lack registered practioners of Ayurveda, Siddha, Unani, Yoga and Naturopathy and Homeopathy. Plants, especially used in Ayurveda can provide biologically active molecular and lead structures for the development of modified derivatives with enhanced activity and reduced toxicity. Medicinal plants comprise approximately 800 species and account for around 50% of the higher plants species of India. These plants are still serving as remedies for various ailments in crude form, as modern medicine has not adequately armed the therapeutic arsenal of natives of remote areas. Documentation of such practices is required in view of gradual disappearance of this knowledge in new generations. A total of 20 species of medicinal important were observed in this study and other detail is discussed in this paper.

Key word: Herbal, medicinal plant, traditional knowledge.

Ecological Restoration for Sustainable Development

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Ecosystem has been essential to survive. Major causes either over exploitation, human greed, urbanization, modern agronomy affecting it at the level of destruction. All ecosystem- farmland, forests, freshwater, grassland, shrubland and savannah, mountains, oceans and coast, peatlands and urban areas are being degraded, often at accelerating rate. Numerous disturbance such as environmental changes that alter ecosystem structure as- logging, damming rivers, mining, intense grazing, hurricanes, floods and fires. Moreover today forests decaying, plant species such as- kale, teak, khair are becoming endangered, numbers of tigers, rhinoceros, elephant, are decreasing day by day. So priority for sustainable development or retaining them in their prior condition-ecological restoration took place. It is only way to create a healthy environment and perform ecosystem management. We are polluting nature's resources by throwing plastics and wastes. If we don't restore now, we can lose 1 million species in upcoming few years.

Keywords: Restoration, Ecology, Sustainability.

Biodiversity Conservation

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Biodiversity and ecosystem affect directly the quality of lives of human on earth and development of well human beings as a whole. Nearly half of the population earns their livelihood directly based on natural resources and biodiversity in many cases. Biodiversity is also at the focal point of many economic activities, including those related to agriculture, forestry and tourism. The 2030 Agenda for Sustainable Development provide a concrete plan for achieving peace and prosperity for everybody on the earth. The Agenda is framed about 17 Sustainable Development Goals, addressing global challenges concerning poverty, inequality, global climate change, environmental degradation, peace and justice. These goals are interconnected and complementary to one another as the progress on one enhances progress toward the others; and biodiversity is critical to all or any of them.

Impact of Agricultural Activities on Aqua-Faunal Diversity of Samaspur Bird Sanctuary, Raebareli, U.P.

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The rapidly developing agricultural land-use practices surrounding the Samaspur Bird Sanctuary threatening the biodiversity and survival of species in Samaspur lake. The study area located at 25°59'20"N Latitude and 81°23'40"E Longitude in Salon block of district Rae Bareli (U.P). The base of the lake system of Samaspur Bird Sanctuary is the ancient drainage system whose current source is Sharda Sahayak Canal. In cropping monopoly, Canalization and chemical fertilizers, herbicides, pesticides, insecticides and various types of antibiotics being used for disease control and high productivity are causing either mutation or extinction in aquatic organisms.

General characteristics of aqua-faunal species in Samaspur lake system have been studied. The catchment basins of the Samaspur lake area (799.371 ha) have been identified and analyzed. The collected data using selected stratified or quota sampling after seasonal observation. In this way, it is clear from the research study that due to agricultural activities and chemical based single cropping system, poisoning is also being done in the environment of the entire bird sanctuary. As a result, due to the destruction of plankton, necessary for water-organisms, being hunted and getting toxic food, the migratory birds coming in the winter season also come to nil now. It is suggested to bio-food chain and its re-cycling can be further studied as a model, Padmashree (Dr.) Subhash Palekar's Natural Farming (agriculture) Model.

Study of Ichthyodiversity at Govindgarh Pond Rewa M.P.

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Fishes are one of the most important aquatic fauna which is directly related with human health and wealth. The Fish are inhabitants of water they inhabit in marine as well as in fresh water. Ichthyofaunal diversity refers to variety of fish species depending on some context. The Govindgarh Pond is one of the big water body and rich in its flora and fauna in M.P. Its water is used for many purposes like pisciculture, irrigation and drinking etc. Fish diversity of Govindgarh Pond is very rich. There are 03 families, 09 genera and 14 species have been found by division of different stations. In Cyprinidae family *Catla catla* was most dominant species, *Cirrhinus mrigala* and *Labeo rohita* . The rare fish *Tor tor* of cyprinidae family is also found. The species is an indication level of community organisation. Several fish diversity, abundance and richness have been proposed to study of fresh water biodiversity. It has been also observed that during breeding seasons people continue fishing that practice effect the natural breeding of fish diversity.

Keywords: Ichthyodiversity, Fish Species, Govindgarh Lake Rewa M.P.

Effect of Storage Time and Conditions on Protein Profiles in Soybean Seeds

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Soybean seeds, known for its high protein value, are known to degrade under harsh environmental conditions. The present study investigated the effect of storage time and storage conditions on protein profiles of soybean seeds. The protein profiles were compared for the freshly harvested (Control) seeds with those stored for short term (3 years), mid- term (6 years) at ambient temperature and moisture, and long term (9 years) kept under cold storage conditions. The total protein reduced significantly for short- and mid-term stored seeds, but did not vary significantly for long term stored seeds under cold storage conditions ($p>0.05$). The change in protein composition for any of the tested seed was not evident while the protein was electrophoresed using SDS-PAGE.

On The Taxonomical Study Of Chaetotaxy Of Larva, *Galerucella birmanica* Jacoby (chrysomelidae : coleopteran)

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Chaetotaxy is the arrangement of macrochaetae (bristles) on the body surface of insects. It is very important for determining homology traits, as well as providing information about the phylogeny between taxa. In the case of chrysomelidae coleopteran *Galerucella birmanica* Jacoby chaetotaxy of larval body segments of larva observe. The body segments of *Galerucella birmanica* larva consist of deeply pigmented areas called as tubercles, which consist setae. In abdominal segments 1st to 8th the tubercles arranged in dorsal group and the spiracles shifted dorsally & the two sub-spiracular fused but the setae i & j retained the ventro-lateral tubercles of either side consist of two setae n & o. The tubercles on the sternum arranged into a ventrolateral group which is formed by the fusion of two mid-dorsal, mid-ventral tubercles each bearing the setae. The 9th abdominal segment is represented by a single Tergite bearing six setae. The 10th abdominal segment is reduced in which setae are absent.

In the prothoracic segment the dorsal and lateral tubercles fused to form a Targal plate consist of eight setae. In mesothorax tubercle 'a' fuse with the tubercle 'c'. The dorsolateral tubercle bears the two setae 'e' and 'h'.

Tubercle 'i' and 'j' distinct but fused and bear setae.

Setae 'k' is absent.

In metathorax setae 'a' is absent and setae 'f' absent from dorsolateral tubercle.

The rest of the setal plan is same as in the mesothorax.

Keywords: Chaetotaxy, Phylogeny, Tubercles.

A Remarkable Increase in Sarus Crane Population during Corona Pandemic in and around Alwara Lake of District Kaushambi, India

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The Sarus crane (*Grus antigone*) is a flagship species of marshland and wetlands. This is the only resident and non-migratory breeding crane of the Indian subcontinent. Its population is gradually decreasing and now globally threatened due to the shrinkage of wetlands, reduction in safe mating sites and enhanced anthropogenic activities. On the contrary, a remarkable increase in the population of Sarus cranes is noticed during a survey conducted from March 2020 to February 2021 in and around the Alwara Lake of district Kaushambi (Uttar Pradesh), India. This systematic survey was done to estimate an increase in the number of Sarus cranes during 2020-2021 when compared to their available population records between 2013 and 2019 from the same study area. This might be due to recent climatic, environmental and ecological progression as an after effect of lockdown during the corona pandemic along with continuous awareness campaigns started since 2012.

Keywords: Alwara Lake, Flagship species, Sarus crane, Vulnerable, Wetland.

Histopathological alterations in the RBC of *Mystus vittatus*(Bloch) exposed to Distillery Effluent

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Toxicological effect of distillery effluent in the catfish, *Mystus vittatus* was investigated in the present study. Distillery effluent discharged from distillery unit of Balrampur Chini mill, Balrampur, U.P. was collected and healthy test fish of 7.0-8.0 cm in length and weighting 8.0-9.0 gm were collected from local fresh water bodies were exposed to a sublethal concentrations (2.5% and 3.0% of LC₅₀ value 3.38 %) of the effluent for a period of 15 and 30 days. The treated fish were compared with the control group for the histological alterations in the morphology of RBC. There was significant reduction in the mean length, breadth and area of erythrocytes in distillery effluent exposed fish. The study revealed marked changes such as membrane disintegration, Anisocytosis, poikilocytosis, double nuclei and rouleaux development, etc. are noticed in the blood tissues of the effluent exposed fish.

Key Words: *Mystus vittatus*, histopathology, RBC, Distillery effluent, blood smear.

Organic Farming: A Key to Sustainable Agriculture

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Agriculture is the backbone of Indian economy. The evolution of technology and development in agriculture has enabled our country to provide food security. As every technology has pros and cons; this advancement in agriculture has directed to imbalance our ecosystem by unsystematic application of an enormous quantity of chemical fertilizers, pesticides in terms of their negative impact on the human health and the environment. So Organic Agriculture is the only solution to nurture the land and to restore the soil by going back to our traditional method of farming i.e., free from chemicals, pesticides and fertilizers. Adaptation and mitigation based on organic agriculture can build on the well-established practice because organic agriculture avoids nutrient exploitation and increases soil organic matter content. Consequently, soils under organic farming capture and store more water than soils under conventional cultivation. Still, organic farming reduces the weakness of the farmers to climate change and variability by comprising highly diverse farming systems and thus, increases the diversity of income sources and the flexibility to cope with adverse effects of climate change and variability, such as changed rainfall patterns. So this paper provides a brief outlook about Organic Agriculture, its major components, its present scenario in India, Govt. policies, the main principles of organic agriculture and limitations in practicing organic agriculture.

Keyword: Organic farming, Sustainable Agriculture, Food security.

Study on Hydro Biological Parameters of Silpara Barrage and Beehar River of Rewa (M.P.) In Reference to Studies of Ichthyo fauna

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The present study deals with the seasonal variation in physico chemical parameters of Beehar river and Silpara barrage water from (2020-2021) covering all three prevailing seasons in this region water was collect during summer winter and mansoon season from five selected sites (s1 to s5) physico chemical parameters such as temperature dissolved oxygen, pH, alkalinity, hardness, TDS and BOD of water playing an important role in the distribution of planktonic flora and fauna the present work on physico chemical parameters provide information on quality of water of beehar river and silpara barrage . The water quality declined duw to discharge the domestic sewage municipal waste from various areas of the town directly affect the biotic community of the river and barrage.

Keywords: Physico Chemical parameters, Beehar river and Silpara barrage

Constraints Perceived by Farmers in Using WhatsApp Messages and Suggestions Given by them to Improve its Effectiveness in Tribal Zone of Bastar Chhattisgarh

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The study was conducted in 5 old KVKs, namely Kanker, Narayanpur, Dantewada, Bijapur & Jagdalpur of Bastar zone of Chhattisgarh. From the selected 5 old KVKs, 5 villages selected each KVK purposively for the study. It is a total tribal area and a 150 users (farmers) selected by the random sampling technique. An interview schedule was prepared for collection relating to constraints faced by whatsapp users for dissemination of information about agricultural technology. The several constraints found among the respondents which are responsible for the low effectiveness about whats app messages. They faced Personal constraints 2.10 (mean score), Economical constraints 2.19 (mean score, Social and cultural constraints 2.08 (mean score, Technical constraints 2.26 (mean score, Physical constraints 2.02 (mean score, Communicational constraints 2.16 (mean score. Technical constraints revealed that the first main constraints with Mean score of 2.26. Followed by Economical constraints 2.19, Communicational constraints 2.16, Personal constraints 2.10, Social and cultural constraints 2.08 and Physical constraints 2.02. The user has not proper technical knowledge and facilities about whatsapp media. So farmers should provide the proper training programmes be organized to provide practical knowledge and govt. should develop the technical facilities on tribal areas.

Current Status of Tomato Production Using Polyhouse Farming in Rewa Division

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The agriculture sector is the backbone of India and most of its population lives in villages agriculture plays an important role in the national economy. At present, food grain production is a difficult challenge for farmers in accordance with the increasing population and changing climatic conditions it. Rapid industrialization and urbanization are taking place in the country and due to this, cultivable land is continuously decreasing, but due to continuous increases in technological innovations in the agriculture sector and reduction in profitable yield, cost reduction can also be seen and it is beneficial for the farmers. Now with the introduction of poly house technology, farming is becoming rural entrepreneurship, and with low capital cost, new employment opportunities have also been created in rural areas. Now the real income of the farmers is increasing. The present study presents the potential of playhouse technology as a form of rural agriculture entrepreneurship with respect to Gandhian theory and its model, the intellectual level of the farmer to understand this technology properly as well as their efficient management in tomato production. While examining, the status of tomato production is to be presented. Apart from this, the agricultural process will also be analyzed through this research. Through the presented study, an attempt has also been made to know about the strategy of the farmer to connect with the market and the role of the government in implementing the schemes related to the subsidy provided by the government for the poly house. Various environmental factors can also be controlled through this technique in the Vindhya division.

Keywords: Polyhouse, Vindhya Division, Farming, Subsidy, Technology, Tomato production

Modification of *Anther Specific Gene1 (AEG1)* promoter from cotton; its application for hybrid seed production technology

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Tapetum specific promoters are key to developing transgenics with *barnase/barstar* gene (for male sterility/restorer lines) for hybrid seed production. A gene expressing in the anther tissue named *AEG1* and its 1.5kb upstream region (promoter) was isolated from cotton. The promoter was found to be active mainly in tapetum tissue of cotton, in addition to a weak activity in roots. In order to modify *AEG1* promoter for its tapetum specificity, two promoters were developed (i) *AEG1ΔB* wherein the -230bp to -500bp of the promoter was deleted (the region carries several copies of the root specific *cis*-elements, ROOTMOTIFAPOX1) and (ii) *AEG1ΔB^{Mut}* where the root motifs in proximal region was mutated in the background of *AEG1ΔB*. Activity of the modified promoters was compared with that of wild type *AEG1* promoter in tobacco transgenics using *β-glucuronidase* as reporter gene. It was observed that in tobacco the WT promoter drives its expression in the pollen and not in tapetum and was also active in roots. In case of the modified promoters, *AEG1ΔB* and *AEG1ΔB^{Mut}*, their activity in roots was reduced and abolished, respectively. Both modified promoters retained their activity in pollen. Further, transgenics in tobacco expressing the *barnase* gene under the wild type *AEG1* and *AEG1ΔB^{Mut}* promoters were developed. No proper transgenics could be developed with wild type *AEG1* promoter, whereas several male sterile lines were found with *AEG1ΔB^{Mut}* promoter. These lines did not set seed on self-pollination but did set seed following cross pollination with untransformed tobacco lines. The possibility of using the modified promoter *AEG1ΔB^{Mut}* to develop male sterile plants in cotton will be discussed.

Green synthesis of silver nanoparticles and to study its antimicrobial properties using fresh water Algae from Mandakini river, Chitrakoot

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Green synthesis of metal particles is an upcoming approach of replacing chemical and costly methods of synthesis. As the uses of metal nanoparticles are increasing day by day in various sectors, the producing methods should also have to grow simultaneously. This study shows the method of synthesis of silver nanoparticles by green algae material, which is the eco- friendly way of producing metal nano particles. The best source of producing metal nanoparticles is from extracts of various plants and living organisms. Different parts of various plants contains the property of producing metal nanoparticles of different sizes when treated with appropriate chemicals. Silver nanoparticles produced in the report were characterized by U-V visible spectrophotometer. The study also discusses the antimicrobial activities of silver nanoparticles against some pathogens, which clearly indicates that, AgNPs carry the ability to inhibit the growth of bacteria. This research discusses the antimicrobial potential of synthesized nanoparticles by algae material. The study can be proven useful for the human health sector in future.

Key words: Silver nanoparticles, Algae, Chemical reduction

Pharmaceutical and Antibacterial study on the leaves of Plant *Cassia fistula* Linn.

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The pharmaceutical study (Physicochemical, Phytochemical, Fluorescence study, Quantitative analysis, Antibacterial activity, RF value, Microscopy and UV Spectroscopy) on leaves of *Cassia Fistula* Linn.(Amaltaas) drug was carried out in present work. The results revealed that physicochemical parameter, such as Loss On Drying (LOD), Alcohol soluble extract and Water soluble extract were found 8.87%, 14.966%, 25.55% respectively. Total Ash (1.22%) and Acid insoluble Ash were compared with the API Standard. Antibacterial activity was carried out in the 95% methanol extract. Maximum zone of inhibition was seen against TBC, Salmonella, and Pseudomonas. TLC profile showed that in Chromatographic Fingerprinting showed that Alkaloids and Flavanoids were present in the leaves of the plant. The other constituents such as Carbohydrates, Resins, Saponins were also seen. The leaf part was found effective in Antimicrobial, Antiperiodic, Duratic, Hepto-protective various other activities. *Cassia fistula* Linn. Leaves can be used in Ayurveda to prepare different types of Herbal products and Medicine which will be able to cure diseases.

Keywords: Ayurveda, Phytochemicals, Chromatographic Fingerprinting, Antibacterial.

Some plant extracts and their active compounds have the potential to regulate hyperthyroidism.

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The two hormones, thyroxine (T₄) and Tri-iodothyronine (T₃) are very important for the maintenance of proper health of a human being. Due to their hypo and hyper-secretion /release, two pathological conditions are primarily seen, commonly known as Myxoedema and Thyrotoxicosis, respectively. Although for hypothyroidism some plant based drugs are available, for hyperthyroidism, nothing much is/was known. We have tried to explore some plant extracts and their phytochemicals that may have the potential to regulate chemical-induced hyperthyroidism. Simultaneously, safe nature of each plant extract was evaluated by measuring lipidperoxidation (LPO) and cellular antioxidant enzymes, such as Superoxide dismutase (SOD) and Catalase (CAT) in liver, the main site of drug metabolism.

Findings of different experiments in the last 2 decades revealed that out of 15+ herbal extracts, and their bio-active compounds, some did inhibit thyroid hormones, indicating them as thyroid- inhibitory agents and their possible use in the regulation of hyperthyroidism / thyrotoxicosis. However, in some cases, higher doses appeared to be hepatotoxic. Obviously, their dose standardization is a must before they are considered suitable for human use.

Keywords: Hyperthyroidism, plant extracts, Thyroxine, Tri-iodothyronine, active compounds

Ecofriendly Pest Management for Stored Grain Pest Ofuttar Pradesh

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Rice is one of the major food crops of the world which is adversely affected on large scale in storage conditions by a variety of stored grain pests, amongst which rice weevil causes significant damage. The rice weevil *i.e.*, *Sitophilus sp.* (L.) is managed by using chemical pesticides and/or insecticides. Although it has been documented that the use of chemical-based insecticides is not only hazardous to the environment, but humans and other species as well, owing to their residual qualities, which pose a health risk. However, the development of pest resistance to many chemical insecticides is the most noticeable one. Considering the above major negative consequences of chemical pesticides, current research has focused on identifying alternate approaches to manage stored pests, a variety of botanical extracts and entomopathogenic microbes have been investigated for their bioefficacy against stored pests.

Except for direct/indirect exposure of botanical extracts and various entomopathogenic microbes on the same and/or other pests, has been largely overlooked even though its understanding would lead to great insight for formulating species-specific biopesticides. Furthermore, it is critical to comprehend the molecular characteristics of ligand binding to species-specific Tyrosine receptors to develop biopesticides that are both safer and more effective. A computational technique might help researchers better understand the mechanics behind botanical components and their efficacy a safe biopesticides for *Sitophilus sp.* and other pest insects.

Morphological and Genetic Variability traits in Cow Pea [*Vigna unguiculata* L. Varieties

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The present investigation was carried out at M.G.C.G.V.V. Chitrakoot, Satna (M.P) India. During kharif season of 2021-22. Twenty genotypes of cowpea were grown in randomized block design with three replications. The genotypes were studied for nine characters viz; Days to 50% flowering, Number of branches/plants, Number of pods per plant, pod length, number of seeds per pod, plant height (cm), Days to maturity, 100- seed weight (g), Soluble protein content. The heritability and expected genetic advance in percent of mean ranged were higher in protein content for grain and fodder yield. The experimental studies revealed substantial amount of genetic variability among the genotypes under study. In general, genotypic correlations were higher than phenotypic ones in magnitude for all the character.

Keywords: *Vigna unguiculata* L., Genetic Variability, Heritability, Genetic advance in percent etc.

Two phase blood flow modelling on Fluctuation in blood flow during Thalassemia

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A person is suffering from thalassemia will have too few red blood cells and too little hemoglobin, and the red blood cells may be too small. The impact of thalassemia can range from mild to severe and life threatening. We have presented a non-Newtonian two phase blood model. Blood is considered as a homogeneous mixture of blood cells and plasma, and also holds power law. We have formed equation of continuity and the equation of motion into tensorial form. We obtained a relation between haematocrit and pressure drop that predict fluctuation in blood flow. We have also collected pathological data of Thalassemia patients, and done graphical study of fluctuation in blood flow. Adopted solution techniques are analytical as well as numerical.

Keywords: Two phase Blood flow, Blood flow during thalassemia, Non-Newtonian, Power law model, Haematocrit, Blood pressure drop.

Biodiversity Conservation

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Biodiversity is the variety of different forms of life on earth including the different plants, animals, micro-organisms, the genes they contain and the ecosystem they form. It refers to genetic variation, ecosystem variation, species variation (Number of species) within an area biome or planet. Relative to the range of habitats biotic communities and ecological processes in the biosphere. Biodiversity is vital in a number of ways including promoting the aesthetic value of the natural environment, contribution to our material well-being through utilitarian values by providing food, fodder, fuel, timber and medicine.

Biodiversity is the life support system organism depend on it for the air to breath, the food to eat and the water to drink, wetlands filter pollutants from water, tree and plants reduce global warming by absorbing carbon and bacteria and fungi breakdown organic material and fertilize the soil. It has been empirically shown that native species richness is linked to the health of ecosystem as is the quality of life for human. The ecosystem services of biodiversity is maintained through formation and protection of soil, conservation and purification of water maintaining hydrological cycle, regulation of biochemical cycles, absorption and breakdown of pollutants and waste materials through decomposition, determination and regulation of the natural world climate. Despite the benefits from biodiversity today's threats to species and ecosystems are increasing day by day with alarming rate and virtually all of them are caused by human mismanagement of biological resources often stimulated by imprudent economic policies; pollution and faculty institutions in addition to climate change. To ensure intra and intergenerational equity; it is important to conserve biodiversity, some of the existing measures of biodiversity conservation include; reforestation, zoological gardens, botanical gardens, national parks, biosphere reserves, germplasm banks and adoption of breeding techniques, tissue culture techniques, social forestry to minimize stress on the exploitation of forest resources.

Keywords: Biodiversity conservation, ecosystem services.

Water Conservation Using Remote Sensing and Gis: A Review

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Water conservation is the practice of sustainably managing the water resources to meet current and future demand of water. Water is the most essential resource for sustaining life on earth. Earth surface is filled with 71.7% of water but only 3% of it is potable water. India is among the highly populated countries of the world but it has only 4% of world's water resource. For the sustainable life we need to take major steps towards water conservation and for this there are numerous methods can be opted by us, rain water harvesting, soak pit, watershed, ground water recharge, drip irrigation etc. The aim of this study is to develop water conservation plan with the help of remote sensing and geographical information system (GIS) tools. Remote sensing and Geographic information system is an effective support for water conservation. It gives all the information about that areas hydrological characteristic, not only the condition of surface water resources but also the groundwater. It helps efficiently in finding the suitable area for watershed development, to identify the potential site for water conservation like check dams, ponds etc. It also helps in storing, managing and displaying spatial data which is used for water conservation projects. This study depicts how efficiently GIS technique facilitates integration of thematic maps, to identify the unique character of different zones of that area in term of its hydrology, and which specific technique is suitable for water conservation in that place. It gives the result by finding the slopes, direction of flow, and digital elevation model and spatial maps of that area. In the end we concluded the importance of spatial data and GIS technology in the management planning and conservation of water resources.

Key words: Water conservation, Rain water harvesting, Remote Sensing (R.S.), Geographic information system (GIS).

Impact of Heavy Metals in Aquatic Animals Especially on Fishes

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Heavy metals are matters that form the dangerous side of water pollution due to their ability to bioaccumulation and cannot be eliminated from the body by metabolic activities. Heavy metal pollution is a serious problem for the environment due to their toxicity, persistency, and bioaccumulation. Heavy metal contamination in the aquatic ecosystem can occur from different natural and anthropogenic sources. Environmental pollution is one of the major challenges for human society now days. Due to the fast-growing industries, and careless destruction of natural resources from the last few decades' aquatic pollution is increasing day by day. The natural sources of heavy metals are mainly volcanic eruption and anthropogenic sources of heavy metals include agricultural and industrial activities, combustion of fossil fuel, waste incinerators, mining, etc. The mobilization of these heavy metals to the aquatic ecosystem alters the physicochemical property of water which is hazardous for aquatic animals. The rich source of high-quality protein filled with vitamins and omega-3 fatty acids encourage the human being to uptake fish as a major food source. So, accumulated heavy metals in the fish tissues directly transfer to the human body and cause toxic effects to expedite various diseases. Studies examined showed that heavy metals cause severe damage on fish thus endanger fish health and ecosystem and constitute respectable risks for human health via consumption of heavy metal contaminated fish.

Keywords: Heavy metal, Effect, Fish; Aquatic animals; Bioaccumulation

Extension Approaches for Mitigating the Climate Impact on Agriculture

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This paper will lead towards the agricultural extension approaches for minimizing the climate impact on agriculture. In this paper it is attempted to explore the various extension techniques suited for the farming community for minimizing the climate impact on crops. As well as on other agricultural allied sectors. Climate change is very likely to affect agriculture and causing food insecurity malnutrition, disease and poverty at the global, regional and local level. Agriculture has to become “climate-smart” to alleviate the challenges posed by global climate change, that is, sustainably increase agricultural productivity and incomes. To tackle the problem of climate change and their effect on agriculture a new concept Climate Smart Agriculture (CSA) was introduced. For achieving the objectives of CSA the extension system has also to be climate smart. “Climate Smart Extension is an approach used to transfer of different forms of climate information to the farmers to make informed farming decisions, climate smart technologies to cope with the climate change and to mitigate the effects of climate change to achieve the global food security”. So, extension can play a crucial role in helping the farmers to deal with the various impacts of global climate change by using the appropriate approach to make awareness and make them aware of the various adaption and mitigation strategies. For strengthening the capacity of farmers on CSA various extension methods like Climate Trainings, Field Demonstration, Climate-Smart Farmers Field Schools, Weather-Based Insurance, Community Based Disaster Management approach, Village Level Custom Hiring Centre, Agro-meteorological Advisory Service and Climate Smart Villages can be used effectively.

New Dimensions of Life Sciences in the Perspectives of Sustainable Development Goals

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Forest biodiversity encompasses the diverse array of species, habitats and genetic diversity within forests. Forests play a crucial role in maintaining the planet's biodiversity, serving as habitats for millions of species of plants, animals, fungi, and microorganisms. They also provide essential ecosystem services such as carbon sequestration, soil conservation and water regulation. In this study, the impact of human activities on forest biodiversity was investigated and strategies for conservation were identified. Furthermore, a literature review and field surveys were conducted to gather data. The results indicated that deforestation, fragmentation and other human activities have severely impacted forest biodiversity with decline observed in species such as primates and large carnivores. To conserve this valuable resource, recommendation of the implantation of conservation measure that focus on reducing human impact and promoting sustainable forestry practices. This includes the establishment of protected areas, restoration of degraded forests, and development of ecotourism. In conclusion, by taking these measures, we can ensure the preservation of unique and essential biodiversity of our forests for future generation.

Study of Cestodes infection in freshwater fish, *Mastacembellus armatus* in relation to body weight of the host fish in India

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Mastacembelus armatus is a well known edible fish of river Betwa, district Jhansi (U.P.) India. To study the nature of cestode infection in the host fish, 240 fishes were examined for two successive years. In each month ten fishes were sacrificed. The prevalence, mean intensity and relative density of cestode infection have been worked out, in relation to body weight of the host. The maximum prevalence, mean intensity and relative density of cestode infection was recorded in the host ranging from 151-250 gm. body weight while minimum was recorded in the host ranging from 51-150 gm. body weight.

Key Words : *Body weight, Cestode, Mastacembelus armatus, Mean intensity, Prevalence, Relative density*

Effect of Organic farming Resources in *Cajanus cajan*(L.) in Satna District. M.P.)

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Cajanus cajan (L) Millsp, (Hindi: Arhar, English: Pigeon pea) (family: Fabaceae) is the most valuable rain-fed agriculture legume crop found in semi-arid tropical area. Organic farming resources as like FYM, Vermicompost, Rhizobium Bio-Fertilizers enhance the natural fertility and Health of the soil or replace chemical elements taken from the soil by previous crops. It is used in the form of nutrient sources play a vital role in increases the enhancing the productivity of the crops. The global Nutrients consumption has increased in the recent years. Most of the countries have become self - reliance in food production which has led to increase in the nutrient consumption per hectare use of high yielding variety of seeds. Indian agriculture rank second largest fertilizer consumption in the world. The All Organic fertilizer used as nitrogen, phosphorus and potassium sources is more than millions tons. The sustainable agriculture is managed by the maintenance of soil fertility and protection of environment that IPNS ensure greatest sustainability in agricultural applications. that's why uses of organic manures in the form of bio- fertilizer are priorities as they exhibit several advantages over chemical fertilizers. Organic Resource such as Rhizobium culture is an effective source of Nitrogen supply as compare to other resources to the *C. cajan* crop . evaluate the effect of rhizobium culture on enhancing Nitrogen content, yield traits, yield of Pigeon pea and improve soil fertility. Hence This article observations based on nutrients management of nitrogen resources and yield traits, effects of Organic manure on yield traits, effects of bio-fertilizers such as Rhizobium for the production of crop.

Keywords: *Cajanus cajan*, Fabaceae, pigeon pea, Nutrients, Bio-fertilizer, Organic farming.

Integrated Farming System: To Improve Agriculture System

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Abstract-Integrated farming systems (IFS) is an eco friendly approach in which waste of one enterprise becomes the input of another thus its make more efficient use of resources from the farm. IFS consists at least two different but logically interdependent parts of a crop and livestock enterprises known as mixed farming system. In an integrated agricultural system, the use of harmful chemical fertilizers, herbicides and pesticides should be minimized and protect the environment from adverse effects. The integrated agricultural system is an effective agricultural system that respects the environment. Unsustainable farming leads to environmental pollution and threatens the livelihood of millions of small farm holders. Increase agricultural production systems for greater sustainability and higher economic returns is a vital process for increasing income and food and nutrition security in developing countries it is able to utilize sustainable agriculture development. The aims at increasing income and employment from small-holding by integrating various farm enterprises and recycling crop residues and by products within the farm itself. The farmers need to be assured of regular income for living at least above poverty line. Advances in output or steady growth in output are necessary to meet the challenges of today's economic, political and technological environment.

Ecosystem Restoration in Yamuna Biodiversity Park

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Restoration of ecosystem aims to recreate, initiate, or accelerate the recovery of an ecosystem that has been disturbed. Disturbances are environmental changes that alter ecosystem structure and function. In this process we restore the degraded ecosystem with the help of plantation of trees or plants of diverse species by using two different types of communities. In this restoration we use applied restoration. This a multi-step process, which include small or all of these stages i.e. assessing the site, formulation project goals, removing sources of disturbance, restoring process, rehabilitating substrates, restoring vegetation, monitoring and maintenance. Ecological restoration can increase both biodiversity and provision of ecosystem services and has an important role in reversing the effects of land degradation and promoting sustainable development. One of the best examples of the restoration of ecosystem in India is the Yamuna Biodiversity Park. It serves as an ideal alternative habitat for migratory and resident bird species. It is also designed to conserve the wild genetic resources of agricultural crops and enhance ground water recharge and augment freshwater availability. An ecosystem restoration is needed to reverse and restore the degraded and polluted ecosystems in their original forms. It helps to maintain ecological balance in the environment. It also makes our environment pollution free. With the help of these things we can easily recreates artificial ecosystems.

Keywords: Restoration of ecosystem, Yamuna Biodiversity Park.

Biotechnological Production of L(+) Lactic Acid From Sugarcane Bagasse

R.C. Tripathi and Ramjee Singh

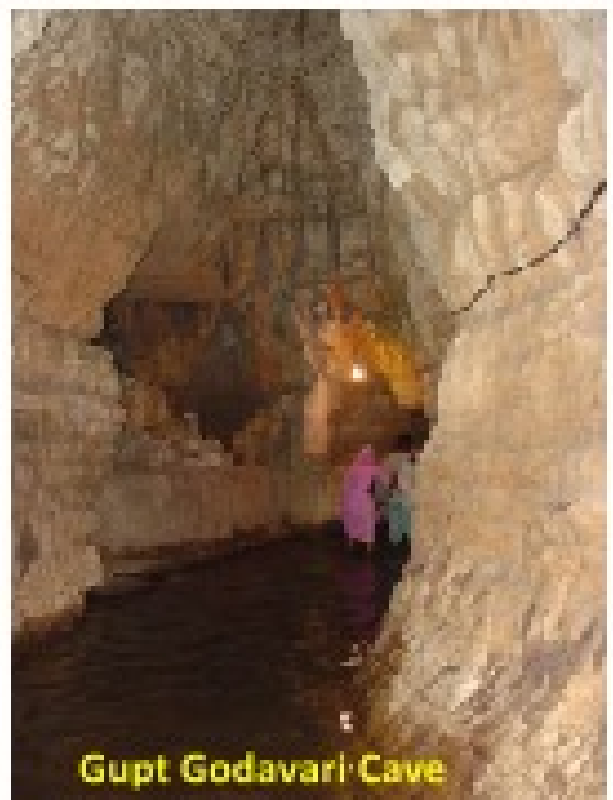
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Lactic acid (2-hydroxypropionic acid) is an organic hydroxyl acid with an asymmetrical carbon atom. Lactic acid can be produced either by fermentation or by chemical synthesis. Lactic acid is mostly used in the cosmetic, pharmaceutical, probiotics and chemical industries and has received increased attention for use as a monomer for the production of biodegradable and biocompatible poly (lactic acid). Lactic acid bacteria (LAB) are a group of Gram-positive bacteria, non-respiring, non-spore forming, cocci or rods, anaerobic bacteria that produce lactic acid. The four standard *Lactobacillus* strains acquired from the National Collection of Industrial Microorganisms (NCIM), at National Chemical Laboratory Pune India, for their potential of lactic acid production. India produces over 250 million tones sugarcane per year, and 34% produced Sugarcane bagasse. Sugarcane bagasse, which is a complex material, is the major by- product of the sugar cane industry. It contains about 50% cellulose, 25% hemicellulose and 25% lignin. Due to its abundant availability, it can serve as an ideal substrate for microbial processes for the production of value-added products. The Solid state Fermentation studies had the overall maximum lactic acid production of 55.15g/L with consortia on Sugarcane bagasse bed material

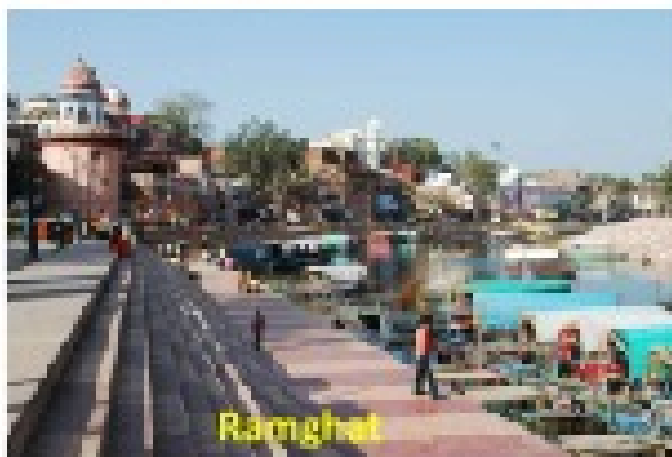
Keywords: - Lactic acid, *Lactobacillus* species, Sugarcane bagasse and Solid state Fermentation.



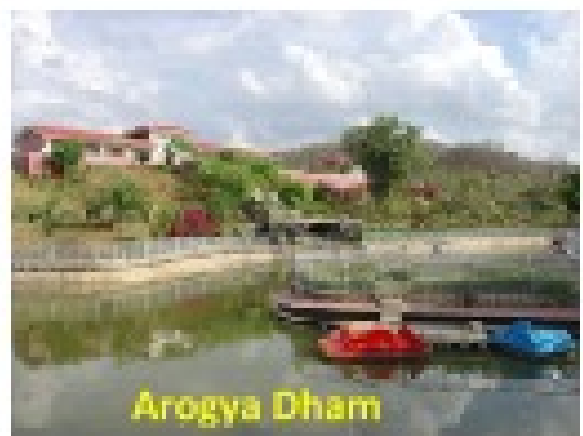
Shri Kanta Nath Temple



Gupt Godavari Cave



Ramghat



Arogya Dham



Ganesh Bagh



Mandakini River



Sphatik Shila



Janki Kund



Bharat Kupp



Sati Anusuiya



Hanuman Dhara



Kalinjar Fort