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## **MAP OF GOVERNMENT SCIENCE COLLEGE GADCHIROLI**

Government Science College, Chamorshi Road, Gadchiroli- 442605. Maharashtra,  
INDIA.



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**Dr. (Mrs.) Vijay Laxmi Saxena**  
General President,  
Indian Science Congress Association, Kolkata.

### **Message**

It is a matter of great pleasure for me to welcome you all to the National Scientific Conference on Multidisciplinary Research on 7<sup>th</sup> and 8<sup>th</sup> April 2022. The conference is organized by Government Science College Gadchiroli in association with Indian Science Congress Association Amaravati Chapter.

Education should be research-oriented and should create something new for the wellbeing of the society. Innovative and out of box thinking is crucial to cope with technological changes. This Conference provides a forum for young researchers to share their innovative ideas with experts from various fields of Science. Furthermore, this conference is relevant in exploring and searching various aspects of education through the appropriate application of multidisciplinary research.

Researchers from various Institutes/ Universities from different parts of the country are presenting their research in this conference. Research presentations by experts will be extremely beneficial for research scholars and will be a stimulating factor for us to organize such conferences frequently in future. I sincerely offer my earnest gratitude to those who are contributing and presenting their research during the conference. I am sure that the proceedings of the conference would provide a better insight in to the latest advancement in the field of Multidisciplinary research.

The consistent efforts of a dedicated and committed team become necessary for organizing such conferences. We are fortunate enough for having such a hardworking team with us. I wish for the grand success of the National Scientific Conference on Multidisciplinary Research 2022.

**Dr. (Mrs.) Vijay Laxmi Saxena**  
General President, Indian Science Congress Association, Kolkata.



**Shri. Vikas Chandra Rastogi, IAS**  
Principal Secretary,  
Higher and Technical Education, Government of Maharashtra.

### **Message**

I am happy to know that the Government Science College Gadchiroli in association with Indian Science Congress Association Amaravati Chapter is organizing a two days National Scientific Conference on Multidisciplinary Research on 7<sup>th</sup> and 8<sup>th</sup> April 2022. I congratulate Government Science College Gadchiroli and Indian Science Congress Association Amaravati Chapter for this academic initiative in tribal and remote area of Maharashtra. This Conference provides a forum for scholarly discussion on various fields of Science. It is also relevant for exploring and searching various aspects of education through the research.

The response of contributors and likeminded educational and research fraternity showing their keen interest in this conference is highly motivating. Presentation of such research papers is extremely beneficial for research scholars in areas such as Gadchiroli. I sincerely offer my earnest gratitude to those who have contributed through their research papers at the conference. I am sure that the conference would achieve its objective by providing a suitable platform for learning and experiencing the latest advancement in the field of Science.

**Shri. Vikas Chandra Rastogi, IAS**  
Principal Secretary,  
Higher and Technical Education, Government of Maharashtra.

**Shri. Vinayak Nipun, IAS**

State Project Director, RUSA, Executive Director, MSFDA,  
State Project Directorate (SPD), Maharashtra.

**Message**

I am happy to know that Government Science College Gadchiroli in association with Indian Science Congress Association Amaravati Chapter organizing two days National Scientific Conference on Multidisciplinary Research on 7<sup>th</sup> and 8<sup>th</sup> April 2022. I congratulate organizing committee for this academic initiative in tribal area of Maharashtra.

This event is targeted towards researchers, professionals, educators and students to share innovative ideas, issues, recent trends and future directions in the fields of science. I am pleased to note that researchers from various Institutes/ Universities from different parts of the country are presenting their research papers on current aspects in various streams of Science. I am sure that this conference would greatly benefit researchers, students and faculty. Young scientists and researchers will find the interactions in the conference helpful to set roadmaps for their future endeavors. I take this opportunity to wish you all a great success of the National Scientific Conference on Multidisciplinary Research 2022.

**Shri. Vinayak Nipun, IAS**

State Project Director, RUSA, Executive Director, MSFDA, State Project Directorate (SPD), Maharashtra.



**Dr. Dhanraj Mane**  
Director, Higher Education, Pune, Maharashtra.

### **Message**

I am pleased to know that Government Science College Gadchiroli in association with Indian Science Congress Association Amaravati Chapter organizing two days National Scientific Conference on Multidisciplinary Research on 7<sup>th</sup> and 8<sup>th</sup> April 2022. I look forward to an excellent meeting of researchers from the various parts of country, sharing exciting and innovative presentations and ideas. This Conference is an excellent opportunity for stakeholders to establish meaningful collaborations. I take great pride in welcoming all participants of the Conference and I am sure that each one of you will benefit from many fruitful and enriching interactive discussions. Let me congratulate the local organizing committee, participants, session chairpersons and keynote and invited dignitaries for great success of the National Scientific Conference on Multidisciplinary Research 2022.

**Dr. Dhanraj Mane**  
Director, Higher Education, Pune, Maharashtra.

## **ABOUT CONFERENCE**

### **About College**

Gadchiroli is situated in the south-eastern part of Maharashtra state. Gadchiroli district shares its boundaries with Chattisgad and Telangana states. The district is categorized as tribal and undeveloped, with farming as the main occupation. Forests cover is more than 79.36% of the hilly geographical area of the district. Government Science College Gadchiroli is a degree college in Gadchiroli district Maharashtra, India. The College is established on 11/09/1987 and run by Government of Maharashtra, Department of Higher and Technical Education, Mumbai (M.S.). It is the only Government College in this remote/tribal place of Gadchiroli running undergraduate and post graduate courses in sciences. The college has been under the jurisdiction of the Gondawana University, Gadchiroli. The college offers bachelor degree courses (BSC), post graduate courses. College is approved research center in the Botany, Chemistry and Zoology subjects.

### **Objectives of National Conference**

The National Scientific Conference on Multidisciplinary Research (NSCMR 2022) will be held on 7th and 8th April, 2022 and is being organized by the Government Science College Gadchiroli in association with Indian Science Congress Amaravati Chapter. This conference will provide a platform for young researchers, scientists, academicians and students of Science faculty from different parts of India to present their original research work in the form of poster and oral presentations. The conference will also present the opportunity for participants to interact and exchange ideas with expert researchers.

### **Conference Focal theme**

Sustainable Development with Women Empowerment

### **Conference Sub Theme**

Physical Science, Chemical Science, Life Science, Sports science, Agriculture and forestry Science, Computer Science, Mathematics, Library Science.



**SCIENTIFIC ADVISORY COMMITTEE AND ORGANIZING COMMITTEE****CHIEF PATRON****Hon'ble Shri. Uday Samant**

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**Hon'ble Shri. Prajakt Tanpure**

State Minister of Higher and Technical Education, Government of Maharashtra, Mantralaya, Mumbai.

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General President, Indian Science Congress Association, Kolkata.

**Shri. Vikas Chandra Rastogi, IAS**

Principal Secretary, Higher and Technical Education, Government of Maharashtra.

**Shri. Vinayak Nipun, IAS**

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**Dr. Prashant Bokare**

Hon'able Vice- Chancellor, Gondwana University, Gadchiroli.

**Dr. Dhanraj Mane**

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**Dr. Atul K. Bodkhe**, Amravati Chapter Convener, ISCA.

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**Dr. Omraj S. Deshmukh**, Treasurer, Amravati Chapter, Indian Science Congress Association (ISCA).

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**Dr. Mahesh P. Chikhale**, Executive Committee Member, Amravati Chapter, ISCA.

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**Santosh Ashataputrey**, Chemistry Department, Government Science College, Gadchiroli.

**Dr. Mandar Paingankar**, Zoology Department, Government Science College, Gadchiroli.

**LOCAL ADVISORY COMMITTEE**

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**Dr. Shailesh D. Deo**, Associate Professor, Mathematics Department, Gondwana University, Gadchiroli.

**Schedule****Day 1: 07 April 2022 (Thursday)**

Time	Detail	Venue
8.00 am to 9.00 am	Registration of Delegates	Registration Counter
9.00 am to 9.50 am	Breakfast	Canteen
11.00 am to 11.15 am	National Anthem and Lightning of Lamp	Auditorium
11.15 am to 12.00 noon	Inauguration Program Chief Guest - <b>Dr. (Mrs.) Vijay Laxmi Saxena</b> , General President, Indian Science Congress Association, Kolkata. <b>Dr. Prashant Bokare</b> , Hon'ble Vice- Chancellor, Gondwana University, Gadchiroli. <b>Dr. Nibedita Chakrabarti</b> , Elected Member of the executive committee, ISCA Kolkatta <b>Dr. Ashok Kumar Saxena</b> , Former, General President, Indian Science Congress Association, Kolkata. <b>Dr. Manoj Kumar Chakrabarti</b> , Former, General President, Indian Science Congress Association, Kolkata.	Auditorium
12.05 Noon to 12.25 pm	Key Note address - <b>Prof. Devesh Walia</b> Professor, Environmental Studies Department, North- Eastern Hill University, Shilong.  <i>Chairperson: Prof. Suresh Zade, Former Head and Professor, Post Graduate Teaching Department of Zoology, R.T.M. Nagpur University, Nagpur.</i>	Auditorium
12.30 pm to 1.30 pm	Lunch Break	
1.30 pm to 2.00 pm	Invited Lecture 1: <b>Dr. Lal Singh</b> , Senior Scientist Group Head, Eco-Rejuvenation Group, Environmental Biotechnology And Genomics Division, CSIR- National Environmental Engineering Research Institute, Nagpur. <i>Chairperson: Prof. Suresh Zade</i>	Auditorium
2.00 pm to 2.30 pm	Invited Lecture 2: <b>Dr. Prakash Rambhauji Itankar</b> Professor, Pharmacognosy Section Head, Department of Pharmaceutical Sciences, and Director, Technology Park, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (India). <i>Chairperson: Prof. Suresh Zade</i>	Auditorium
2.35 pm to 4.00 pm	Oral Presentations	Auditorium
4.00 pm to 4.05 pm	Remark of Chairperson <i>Prof. Suresh Zade</i>	Auditorium
4.05 pm to 4.20 pm	Tea Break	Canteen
4.25 pm to 5.30 pm	Poster Presentation and Visit to Laboratory	College campus

**Schedule****Day 2: 08 April 2022 (Friday)**

Time	Detail	Venue
09.00 am to 09.50 am	Breakfast	Canteen
10.00 am to 10.45 am	Invited Lecture 3: <b>Dr. Kishor Rewatkar</b> , <i>Professor and Head of Department of Physics, Dr. Ambedkar College, Nagpur.</i>  <i>Chairperson: Dr. Hemlata Chaudhari-Wankhede</i> Invited	Auditorium
10.45 am to 11.30 am	Lecture 4: <b>Dr. Anil N. Korpenwar</b> , <i>Principal, Rashtrapita Mahatma Gandhi Arts and Science College, Nagbhid.</i>  <i>Chairperson: Dr. Hemlata Chaudhari-Wankhede</i>	Auditorium
11.30 am to -12.30 pm	Poster presentation evaluation	
12.30 pm to 01.20 pm	Lunch Break	Canteen
01.30 pm to -02.30 pm	Oral Presentation	Auditorium
02.30 pm to -03.30 pm	Valedictory Function	Auditorium
03.30 pm to -04.30 pm	Certificate Distribution	
04.30 pm to -05.00 pm	High Tea	

Abstract Invited Lecture - 01**Eco-Rejuvenation of Wasteland for Socioeconomic Development in Rural areas****Dr. Lal Singh**

CSIR-National Environmental Engineering Research Institute (CSIR-NEERI), Nehru  
Marg, Nagpur, Maharashtra 440 020, India  
Email - [lalsingh@neeri.res.in](mailto:lalsingh@neeri.res.in)

Eco-restoration is a technique for rejuvenation of degraded ecosystem to their near original state, alongside to control soil erosion, develop microbial ecology and biomass production, and enhance socio-economic development. The present study has been focused on a new approach called Eco-Rejuvenation Technology (ERT), which is an integrated biotechnological approach. ERT serves as a prototype for reclamation and ecological/biodiversity restoration of degraded land. To demonstrate this technology, plantation of seedlings (two year old) of different bamboo species as *Bambusa balcooa*, *Bambusa vulgaris* (Green), *Bambusa vulgaris* (Yellow), *Bambusa nutans* and *Dendrocalamus asper* etc. was carried out in a village community degraded land, Fly ash dumped areas, waste lands and Farmers fringe areas located in Central India, utilizing organic amendments, such as press mud, farmyard manure and bio-fertilizers. This study shows how ERT benefited the growth of bamboo (viz., increased height, diameter, number of culms) and further explains how it helped in increasing soil biomass and carbon sequestration capacity over a period of three year. The results reflected that the success of a rural wasteland/ degraded/ village community land restoration program depends on community participation and socio-economic factors as equally as ecological amelioration. In this study, the soil organic carbon was restored to nearly 2% within three year in rhizospheric soil. The study suggests that ERT is a potential tool for sustainable rural development and native biodiversity development on degraded land.

**Key-words:** Wasteland reclamation, Eco-restoration, Eco-rejuvenation Technology, Sustainable rural development, Bamboo plantation

Abstract Invited Lecture – 02**Organic vs. Conventional Cultivation of Anti-diabetic Medicinal Plants****Prof. Prakash R. Itankar**

Department of Pharmaceutical Sciences, Pharmacognosy and Phytochemistry Division,  
Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur 440 033 (MS) India.

**Abstract:**

The medicinal use of natural products and / or compounds that are derived from natural sources such as plants, animals or micro-organisms - precedes recorded human history probably by thousands of years. Palaeoanthropological studies at the cave site of Shanidar, located in the Zagros Mountains of Kurdistan in Iraq, have suggested that more than 60,000 years ago, Neanderthals might have been aware of the medicinal properties of various plants, as evidenced by pollen deposits in one of the graves at the site (Solecki, 1975). Recognition of their clinical, pharmaceutical and economic value is still growing, although this varies widely between countries (World Health Organization, 1998).

The WHO estimates that in many developed countries, 70 % to 80 % of the population has used some form of alternative or complementary medicine including Ayurvedic, Homeopathic, Naturopathic, Traditional oriental and Native American Indian medicine (World Health Organization, 2008). It is also recognised by the WHO that herbal medicines are the most popular form of traditional medicine and are highly lucrative in the international medicine market. The market for medical plants in India stood at Rs. 4.2 billion (US\$ 56.6 million) in 2019 and is expected to increase at a CAGR 38.5% to Rs. 14 billion (US\$ 188.6 million) by 2026. The total world herbal trade is currently assessed at US\$ 120 billion. The WHO estimates that, by 2050, trade in herbal medicinal products will be up to US \$5 trillion (Anonymous, 2011).

India is the seventh largest country in the world and Asia's second largest nation with respect to area (Anonymous, 1985). India possesses a distinct identity, not only because of its geography, history and culture but also because of the great diversity of its natural ecosystems. It ranks sixth among the twelve mega-biodiversity centres of the world and is home for an unusually large number of endemic species. India is unique, in its numerical species and also for the range of biodiversity attributable to a variety of biogeographically and physico-environmental situation. A characteristic feature of Indian forests is the interspersed human inhabitation with people dependent on the biological resources for their sustenance and livelihood (Lal, 1989).

Among ancient civilisations, India has been known to be rich repository of medicinal plants. The forest in India is the principal repository of large number of medicinal and aromatic plants, which are largely collected as raw materials for manufacture of drugs and perfumery

products (Kadam, et al. 2013). India has 15 agroclimatic zones that comprise ~18,000 types of plants, of which 6,000-7,000 have therapeutic properties. These medicinal plants are used in numerous applications in the Indian society and used to make medicines in traditional medical practices such as Ayurveda, *Unani*, *Siddha*, *Sowa-Rigpa* and homeopathy; also used in plant-based pharmaceutical companies. ~960 types of medicinal plants are traded, of which 178 species have yearly consumption levels of >100 metric tonnes. ~80% medicinal plants are extracted from the wild, while 69% plants are collected using destructive farming practices.

There is a huge gap between the supply and demand of medicinal plants to manufacture Ayurvedic medicines in India. According to the 'All India Trade Survey of Prioritised Medicinal Plants, 2019', demand for high-value medicinal plants increased by 50%, while the availability declined by 26%. This led to increased habitat degradation and levels of over-exploitation by pharmaceutical industries. This also resulted in 65 species (i.e., 10% of the total species) falling into the critically endangered, vulnerable, and nearly threatened categories.

For ayurvedic medicines, raw materials such as herbs and shrubs can be grown and harvested in a period of one year, while medicinal trees take >10 years to get ready for harvesting. Therefore, it is important to engage in conservation, cultivation, and research & development of medicinal plants. With the rapid depletion of forests, impairing the availability of raw drugs, Ayurveda, has reached a very critical phase.

Consequently, cultivation of these plants is urgently needed to ensure their availability to the industry as well as to people associated with traditional system of medicine. If timely steps are not taken for their conservation, cultivation and mass propagation, they may be lost from the natural vegetation, forever. In situ conservation of these resources alone cannot meet the ever increasing demand of pharmaceutical industry. It is, therefore, inevitable to develop cultural practices and propagate these plants in suitable agroclimatic regions. Commercial cultivation will put a check on the continued exploitation from wild sources and serve as an effective means to conserve the rare floristic wealth and genetic diversity (Thenmozhi, et al. 2010).

Worldwide revolution for the improvement of people safety is gaining momentum; hence drug safety for the subject becomes even more prominent in the present day scenario. Cultivation of medicinal plants with laboratory generated species is being attempted on the basis of chemical composition and is likely to be used in increased manner for commercial purposes. These changes may have profound impact on the safety and efficacy of the Ayurveda drugs in the market. Hence, a mechanism is required to be put in place to address them (Dey, et al. 2012).

However, Biological Diversity Act (2002) and Rule (2004) enforced the noble thought of protecting our biodiversity especially crude drugs from plant origin (Hasan and Solaiman, 2012). Therefore it has become essential criterion for all the herbal industries and those working on medicinal plants, to produce these crude drugs by cultivation in the fields. A series of food scares and the controversy surrounding genetically modified crops have prompted heated debate about the safety and integrity of our food and herbal medicines. Against this background, demand for organically grown food has been growing rapidly (Holdan, 1945). Increasing consciousness about conservation of environment as well as health hazards associated with agrochemicals and consumers' preference to safe and hazard-free food are the major factors that leads to the growing interest in alternate forms of agriculture in the world. Organic

agriculture is one among the broad spectrum of productive methods that are supportive to the environment. The demand for organic food is steadily increasing both in the developed as well as developing countries, expected to reach \$ 519 billion by 2027 from \$ 232 billion in 2021.

An effort will be made with scientific approach to resolve this intricate issue of supply of good quality raw material (crude drugs) which can be addressed by organic cultivation, collection and proper postharvest procedure followed by stringent quality control norms. Until now this perception that, organically grown food is 'better for you' appears to have been largely based on intuition rather than conclusive evidence. Therefore, the present chapter validates the perception in terms of growth pattern by taking *Momordica charantia*, *Ocimum sanctum*, *Trigonella foenum graecum*, and *Gymnema sylvestre* as experimental models. The chapter covers different cultivation technologies (organic & non-organic) which will precisely address major issues, will give a new dimension and generate essential guidelines on the cultivation of medicinal plants for the herbal manufacturing industry regarding the source, identity and quality of medicinal plants. The outcome shall be of immense importance to herbal manufacturing industry, growers, farmers, traders, vendors, etc, with regard to assurance of quality of any medicinal plant coming from the cultivated fields.

The present investigation was carried out in the Department of Pharmaceutical Sciences, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur (MS) India, situated in the center of the Indian peninsula 79° 7' East longitude and 21° 7' North latitude and is at a mean altitude of 310.5 meters above sea level. The average annual rainfall of the area is 1205 mm. The average maximum temperature of the city is 33.53°C and the average minimum temperature is 20.37°C and the relative humidity ranges from 20% to 70% (Wikipedia, 2012).

The experimental example deals with the analysis of soil from the cultivation area, followed by two different treatments, organic and non-organic (in terms of fertilizer and insecticide/fungicide) were utilized. The land for the organic treatment was converted (period 2.5 years before 1<sup>st</sup> harvest) as per the recommendations of National Centre for Organic Farming, India (Yadav, 2011) and the parallel area with marked buffer zone was selected for conventional treatment. The soil of experimental site was comprised of black clay soil with neutral pH, rich in humus, potash and trace elements (Cu, Fe, Mn and Zn). The "ideal" soil pH is close to neutral, and neutral soils are considered to fall within a range from a slightly acidic pH of 6.5 to slightly alkaline pH of 7.5. It has been determined that most plant nutrients are optimally available to plants within 6.5 to 7.5 range, also this range of pH is generally very compatible to plant root growth (Dinesh, *et al.* 2014 ). All the seeds and stalks were sown in their favorable season with the implementation of good agricultural practices by adopting the randomized block design in twelve replicates of each treatment in the year 2012. Almost all the morpho-physiological traits of plants (pre and post-harvest) were examined using statistical package PAST (Version 2.03).

For the organic cultivation the biodynamic manure and organic pesticides (neem seeds extract & fermented garlic extract) were utilized as per the SOP of Govigyan Anusandhan Kendra Deolapar, while in case of non-organic cultivation the conventional manures (urea, super phosphate & potash) and chemical pesticides (Monocrotophos & Zineb) were utilized. In both the crop pattern, aerial parts of *Trigonella foenum graecum* (organic and non-organic) [OTF & NTF], *Ocimum sanctum* [OOS & NOS] and *Gymnema sylvestre* [OGS & NGS] leaves



were harvested at the time of maturity (flowering). *Momordica charantia* (OMC & NMC) unripe fruits were harvested (Farooqi and Sreeram, 2010)

All the plants with organic treatment comparative to non-organic crop showed three to fifteen days early initiation of flowers/infloroscence followed by early fruiting (OMC) and legumes (OTF). Different morpho-physiological traits for different plants were examined and all the mean values in organic treatment were higher except the overall yield that was higher in non-organic crop. OMC found with higher mean values of number of flowers, secondary branches, roots length, secondary roots and height of climber. It was also observed that NMC produced more number of fruits but the fleshier and bigger fruits were produced by OMC comparative to NMC. The ultimate average yield of fruits were higher in NMC compared with the OMC. OOS revealed the bigger height, root, more number of secondary branches and secondary roots, except only the weight of whole plant that was found with the greater mean value in NOS. As similar to OOS, the OTF along with same traits also showed the more number of leaves and root nodules which indicate the more rhizobia and may cause more nitrogen fixation in soil. NTF gave the higher weight of plant and more average yield. NGS was found with higher amount of leaves, while all other traits were higher in OGS. The higher mean values of organic crop may be attributed to the presence of plenty of 'beneficial soil microbes' in organic manure which helps in 'soil regeneration' & 'fertility improvement' and protect them from degradation while also promoting growth in plants (Sinha, 2009). The late commencement of adult vegetative phase might be responsible in non-organic crop for their low mean values in majority of morpho-physiological traits (Ha, 2014). Four medicinal plants viz. *Momordica charantia*, *Ocimum sanctum*, *Trigonella foenum graecum* and *Gymnema sylvestre* were cultivated by organic and non-organic methods of cultivation, following the randomized block design and good agricultural practices. All the organic plants exhibited early flowering, greater height, more number of leaves, secondary branches, secondary roots and root nodules justifying their better nourishment and growth in organic environment.

**Acknowledgement:** I acknowledge my student Dr. Mohammad Tauqeer Sheikh who worked on this research project as Research scholar during his Ph.D.

Abstract Invited Lecture – 03**Nanoscience and nanotechnology for sustainable development****Prof. Kishorchandra Rewatkar**

Professor and Principal, Vidya Vikas College, Samudrapur, Dist Wardha

Email: [kgrewatkar@gmail.com](mailto:kgrewatkar@gmail.com)

Nanotechnology has important roles to play in international efforts in sustainability. We discuss how current and future capabilities in nanotechnology align with and support the United Nations' Sustainable Development Goals. We argue that, as a field, we can accelerate the progress toward these goals both directly through technological solutions and through our special interdisciplinary skills in communication and tackling difficult challenges. We discuss the roles of targeting solutions, technology translation, the circular economy, and a number of examples from national efforts around the world in reaching these goals. We have formed a network of leading nanocenters to address these challenges globally and seek to recruit others to join us. Nanotechnology is one of the most promising key enabling technologies of the 21st century. The field of nanotechnology was foretold in Richard Feynman's famous 1959 lecture "There's Plenty of Room at the Bottom" and the term was formally defined in 1974 by Norio Taniguchi. Thus, the field is now approaching 50 years of research and application. It is a continuously expanding area of research, contributing to almost every field of science natural sciences and engineering, materials science, medicine, agriculture, information/communications technologies and this list continues to grow. Nanotechnology started coming into its own in the 1980s, gaining public exposure and awareness (including having to navigate some controversy), and commercial applications of the new technologies began. Now, as society faces serious, even grave, challenges, we look to new technologies to offer solutions in almost every aspect from health, energy, climate, and environment, either directly or indirectly. In 2017, the United Nations set out the urgent call for action for all countries in its Sustainable Development Goals (UN SDGs), recognizing that ending poverty and other deprivations go hand-in-hand with improving health, environment, and the economy to reduce inequality in all areas. In November 2020, representatives from a group of leading nanotechnology research institutes met for the virtual International Workshop on Nanotechnology for a Sustainable Future with a focus on how nanotechnology and its applications can address these goals, with speakers from five countries spanning four continents hosted by the Waterloo Institute for Nanotechnology at the University of Waterloo, Canada. Here, one of the key outcomes was recognizing the need for an International Network for Sustainable Nanotechnology (N4SNano)<sup>5</sup> to create a global forum to find solutions to achieve this vision and to invite others with new thoughts and ideas. A main focus of this network is to bridge the wide gap between scientists and technologists with governments and policy-makers around the world for ready adoption of much-needed technology-based solutions to our current problems.

**WHY NOW?**

The world is currently suffering from the individual and collective effects of biodiversity loss, deforestation, irresponsible waste disposal, air pollution, water insecurity, toxic burdens, plastics pollution, global warming from fossil fuels, and climate change. Social stressors in many regions lead to poor health, inadequate access to medical care, and poor education and skills training, further leading to expanding inequalities. Civilization is on a dangerous path with an uncertain future. Instead of incremental improvements to existing technologies, nanotechnology offers disruptive, game changing breakthroughs and innovations that can provide immediate answers and solutions to help our society, environment, and the planet. Areas in which nanotechnology advances are making differences include energy, environmental protection, resource management, and healthcare through the development of smart materials and connected devices. Further, nano-science and nanotechnology, as fields, have developed communication skills to bring scientific, engineering, medical, and other communities together, and have thus impacted many related fields.

**NANOTECHNOLOGY AND MATERIALS**

Nanotechnology and materials are expected to play important roles in the realization of Society. Nanotechnology will drive the digital transformation by providing diverse nano-devices to be used in Society, such as IoT sensors, autonomous driving vehicles, smart robots, and others. Nanotechnology and materials are also expected to contribute to the realization of a sustainable society through ensuring water purification, reducing CO<sub>2</sub> emissions, and promoting material circulation with recycling approaches. Nanotechnology and materials also support our health and well-being through wearable biosensors and biomaterials for regenerative medicine. There are a number of technical challenges in nanotechnology and materials, as well.

**AUTOMOBILES TO ENABLE DRIVING WITH HIGH SAFETY AND LOW ENVIRONMENT IMPACT**

To improve driving safety and environmental impact, many nano-devices and advanced materials are or can be used. Sensors and radars, real-time processors with AI chips, and inter-vehicle and road-to-vehicle communication will help realize autonomous or intelligent driving with high safety. High-power semiconductor devices with wide band gap materials; high-performance motors with rare earth magnets, next-generation lithium (Li)-ion batteries, and fuel cells with green hydrogen; and high-strength and lightweight materials such as carbon-fiber-reinforced polymers (CFRP) will help decrease the environmental impact of driving.

**REMOTE HEALTH AND MEDICAL CARE**

Nanotechnology enables remote health and medical care for people living in rural regions. The shortage of medical doctors is becoming a serious problem due to an aging society, such as in Japan. During the current pandemic, such remote care has become both more common and more accepted. Health and medical data for patients living in rural regions are taken in person by doctors and/or by wearable biosensors. In some cases, data are sent to a data center automatically and analysed with high-performance computers. Thus, health and medical diagnoses are becoming possible with the help of AI without needing to travel to a city or town with a large hospital. Due to the increasing use of surgical robotics; various sensors, including touch sensors, high-resolution image sensors, and monitors; and 5G/post-5G communication, remote medical treatment and surgery are expected to be possible. Such models can be easily

integrated to urban societies and across different jurisdictions with an effort to democratize healthcare access and affordability.

### **NANOBIO/MATERIALS/PHOTONIC TECHNOLOGIES AGAINST EMERGING DISEASES**

Nanobiotechnology is expected to contribute to medical care against emerging infectious diseases such as COVID-19 through diagnoses using nanodevices as well as drug discovery and medical treatment. Materials and photonic technologies can also be effective for infection prevention, particularly for virus inactivation using photocatalysis nanoparticles or deep ultraviolet AlGaIn lightemitting diodes, and in air purification through virus capture with various membranes. These technologies will also contribute to better understanding of the interactions of pathogens with various materials. In these developments, nanoscale simulations and data science will play important roles.

### **OPPORTUNITIES FOR TECHNOLOGY AND SUSTAINABILITY**

Nanotechnology has already brought many benefits to society and many further opportunities to develop and to implement new technologies exist, with countless more yet to be discovered. However, along with the benefits of nanotechnology research and development come potential risks. Revolutions often have unintended consequences and, in some cases, can spawn counter movements (e.g., genetically modified organisms in agriculture). Gaps remain in our understanding of the consequences of nanotechnology on human health and the environment. The ability to assess and to mitigate these risks is necessary to ensure nanotechnology is safe and sustainable, and that “nano” can credibly be a driver of a sustainable planet and future. In other words, despite the potential for nanotechnologies to lower the probability of exceeding each of the nine planetary boundaries (climate change, biosphere integrity, land-system change, freshwater use, biogeochemical flows, ocean acidification, atmospheric aerosol pollution, stratospheric ozone depletion, and release of novel chemicals), a fundamental tension for nanotechnology development is to ensure that, in reducing established risks related to one particular planetary boundary, novel risks related to other boundaries or the boundary associated with “novel entities” are not created.

### **FINAL THOUGHTS**

Yuval Noah Harari, in his book *Sapiens: A Brief History of Humankind*, emphasizes that we as “humankind” are a minority on the planet. However, through our collective intelligence and ability to work collaboratively, we have emerged as the dominant species on earth. Therefore, we have a tremendous responsibility to pass along this amazing ecosystem to future generations. Nanotechnology, a cutting-edge technology of the 21<sup>st</sup> century will enable us to target and to achieve this unified vision of a sustainable planet for all.

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Oral Presentation OP-01**DNA barcoding of catfishes from tributaries of Wainganga river of Central India****Satyanarayan Pusala<sup>1,2</sup>, Neelesh Dahanukar<sup>3</sup>, Mandar S. Paingankar<sup>1</sup>**<sup>1</sup> Zoology Department, Government Science College, Chamorshi Road, Gadchiroli, Maharashtra, India.<sup>2</sup> Zoology Department, Mohsenbhai Jhaveri Arts Science College Wadsa, Gadchiroli, Maharashtra, India.<sup>3</sup> Department of Life Sciences, Shiv Nadar University, NH - 91, Tehsil Dadri, Gautam Buddha Nagar, Uttar Pradesh – 201314Email - [spusala12@gmail.com](mailto:spusala12@gmail.com)

The knowledge of the diversity, distribution and evolutionary history of the fish fauna is essential for designing and implementing the conservation strategies. The data on the evolutionary history, diversity and distribution of fish fauna of the Vidarbha region of Maharashtra is limited as most of the rivers have not been surveyed extensively and checklists for individual rivers are not available. The diversification of Siluriformes is unresolved mystery and catfish have been established as an excellent model for understanding historical biogeography at various scales. Molecular phylogenetic analysis using the DNA sequences mitochondrial genes will provide better insights in to diversification of catfishes. A very few studies are available in literature which documented the genetic barcodes of catfishes of central India. In the current study, DNA barcodes based on the mitochondrial cytochrome c oxidase subunit I (COI) gene were generated for the catfishes of Wainganga River and its tributaries. A total of 81 mitochondrial COI barcode sequences were obtained from 13 species belonging to 07 genera of catfishes. The mean length of the sequences was 640 base pairs. The generated sequences were subjected to similarity search results, molecular phylogeny analysis and genetic divergence analysis. The neighbor-joining (NJ) trees based on the sequences clustered the species in accordance with their taxonomic position. *Clupisoma bastari* and *Rita bakalu* were recorded first time from Wainganga river tributaries. The current study will helpful in generating a reliable DNA barcode reference library of catfishes of Central India.

Keywords: Wainganga river, DNA barcode, COI gene, Molecular phylogeny

Pusala S.V., Dahanukar, N. Paingankar M.S. (2022) DNA barcoding of catfishes from tributaries of Wainganga river of Central India. In book of abstracts, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p.00



Oral Presentation OP-02**Histopathological study of cestode parasite, *Cotugnia wankhedii* sp.  
From *Gallus gallus domesticus*.****Ulka P. Aade<sup>1</sup>, Hemlata J. Chaudhari-Wankhede<sup>2</sup>**<sup>1</sup>Department Of Zoology, Government of Maharastra Ismail Yusuf College, Jogeshwari,  
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The aim of the present study is to investigate the histopathological changes in the intestine of the domestic chickens *Gallus gallus domesticus* that infected with the cestode *Cotugnia* sp. A report on identification of this parasite from a chicken is placed on record. The worm *Cotugnia wankhedii* n.sp. is having adhering type of scolex with help of hooks, they damage the intestinal tissue of host *G. gallus domesticus* (Linnaeus, 1758). Microscopically observation reveled that, the T.S. of intestine of host showing the damage to the intestinal wall by adhering scolex of *Cotugnia wankhedii* n.sp due to this attachment it has disturbed the structure of intestinal region and broken the intestinal villi. Moreover, worm tries to overcome the entanglement of the crypts of liberkubin. Occurrence of bundles of fibrosis in longitudinal section of damaged villi.

**Keywords:** Cestode parasite new Sp. *Cotugnia wankhedii*, *Gallus gallus domesticus*,

Aade, U. P. and Chaudhari Wankhede H.J. (2022) Histopathological study of Cestode parasite, *Cotugnia wankhedii* sp. from *Gallus gallus domesticus*. In book of abstracts, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p.00

Oral Presentation OP-03**Studies on the effect of cestode parasites infection on biomolecules of *Gallus gallus domesticus*****Avinash B. Gholap<sup>1</sup>, Hemlata J. Chaudhari-Wankhede<sup>2</sup>**<sup>1</sup>Department of Zoology, ACS and CS College, Ashvi kd, Ahmednagar. (M.S), India<sup>2</sup>Principal, Government Science College, Gadchiroli. (M.S), India**Email - [avee143van@gmail.com](mailto:avee143van@gmail.com)**

The present investigation was determining the effect on protein, lipid and glycogen biomolecules due to infection of cestode parasite in *Gallus gallus domesticus*, which is naturally infected with cestode parasites. Biochemistry or biological chemistry is a study of chemical processes occurring into body of living organisms. The effect on protein, lipid and glycogen biomolecules due to infection of cestode parasite the result shows that changes in biomolecules concentration due to cestode infection. Glycogen content in cestode 13.2 mg/gm and Host intestine (normal) contain 41.6 mg/gm and infected intestine of host contented 32.31 mg/gm. The protein content of cestode showing 6.8 mg/gm of tissue where as in host intestine (Normal) 14.5 mg/gm weight of tissue of an infected intestine of host intestine 10.8 mg/gm wt. of tissue while The lipid content of cestode is showing 24.4 mg/gm of tissue where as in host intestine (Normal) 27.5 mg/gm weight of tissue of an infected intestine of host intestine 8.3 mg/gm wt. of tissue.

**Keywords:** Cestode, Parasite, *Gallus gallus domesticus*, Biomolecules

Gholap A.B. and Chaudhari-Wankhede H.J. (2022) To studies the effect on biomolecules due to cestode parasites infection in *Gallus gallus domesticus*. In book of *abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p.00

Oral Presentation OP-04**Prevalence of Cestode parasites in Fishes from Aurangabad region of Maharashtra (India)****Nutan N. Pawar<sup>1</sup>, Hemlata J. Chaudhari-Wankhede<sup>2</sup>**<sup>1</sup>Zillha Parished Highschool, Bahirgann, Kannad, Aurangabad<sup>2</sup>Government Science Colleges, Gadchiroli (M.S), IndiaEmail - [nutanpawar101@gmail.com](mailto:nutanpawar101@gmail.com)

Given study deals with the prevalence of Helminth parasites in Fishes from Aurangabad district of Maharashtra. The experimental work was conducted of the period from February 2017 to January 2018. About 49 infected intestinal samples from host were collected from different villages of Aurangabad district of each month of year. After that parasites examination and maintain the record of infected host and cestode parasites count and calculate prevalence, mean intensity and abundance, which is on an average prevalence rate of infection was (41.33%), mean intensity is (2.20) and abundance is (1.33) for given result conclude that requirement of proper development of hygienic practice to control the parasite infection and decrease the rate of the infection in fishery management.

Keywords: Prevalence, Cestode parasites, Helminth, Fishes, Mean intensity

Pawar, N. and Chaudhari-Wankhede H.J. (2022) Prevalence of Cestode parasites in Fishes from Aurangabad region of Maharashtra (India). *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p.

Oral Presentation OP-05**Functional morphology of mouth parts of *Cheilomenes sexmaculata* Fabricius, 1781 (Coccinellidae: Coleoptera)****Prakash Ghagargunde<sup>1,2</sup>, Mandar S. Paingankar<sup>1</sup>**<sup>1</sup> Zoology Department, Government Science College, Chamorshi Road, Gadchiroli, Maharashtra, India.<sup>2</sup> Zoology Department, Mahatma Gandhi College, Saoli, Chandrapur, Maharashtra, India.Email - [pgghagargunde4u@gmail.com](mailto:pgghagargunde4u@gmail.com)

*Cheilomenes sexmaculata* Fabricius, 1781, is well known lady bird beetle, feeds primarily on aphids and other small insects. Understanding of fine structure of mouthparts of *C. sexmaculata* will provide the better understanding of feeding mechanism of lady bird beetles. Using the scanning electron microscopy, we studied the functional morphology of mouthparts of *C. sexmaculata* and the compared the fine structures with other lady beetles. The mouthpart of *C. sexmaculata* is comprised of labrum, mandible, maxillae, labium, and hypopharynx and a detailed description of each mouth part along with the various types of sensilla is documented in this study. In total, 3 types of sensilla chaetica, 3 types of sensilla basiconica, 2 types of sensilla styloconica, one types of sensilla coeloconia, and one type of cuticular pore were identified according to their length, morphology and distribution. The differences between *C. sexmaculata* and other coleopteran beetles were compared. These results will provide better insights in to the functional morphology lady beetles.

Keywords: Scanning Electron Microscopy, *Cheilomenes sexmaculata*, Sensilla, functional morphology

Ghagargunde, P. and Paingankar, M.S. (2022) Functional morphology of mouth parts of *Cheilomenes sexmaculata* Fabricius, 1781 (Coccinellidae: Coleoptera). In book of abstracts, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-06**Studies on inhibitory effects of novel synthesized 1,2,4-Triazoles and 1,3,4-Thiadiazoles against different bacterial strains****Roshan D. Nasare<sup>1</sup> Mohammad Idrees<sup>2</sup>, Naqui J. Siddiqui<sup>2</sup>**<sup>1</sup>Department of Chemistry, Government Science College Gadchiroli, Dist-Gadchiroli(M.H.) India.<sup>2</sup>Department of Chemistry, Government Institute of Science, Nagpur-440001(M.S.) IndiaEmail - [nasare.roshan17@gmail.com](mailto:nasare.roshan17@gmail.com)

In this study, novel synthesized compounds 1,2,4-triazoles ( **1a-h** ) and 1,3,4-thiadiazole ( **2a-h** ) were evaluated for their in-vitro antibacterial activity at different concentrations against two Gram positive bacterial strains, B. thurengienesis and S. aureus and two Gram negative strains, E. coli and E. areogenes. The results obtained revealed that 1,2,4-triazoles and 1,3,4-thiadiazoles show their potent activity against tested bacterial strain when compared with Chloramphenicol antibiotic as the standard.

Keywords: 1,2,4-triazoles, 1,3,4-thiadiazole, Antibacterial

Nasare, R.D., Idrees, M., Siddiqui N. J. (2022) Studies on inhibitory effects of novel synthesized 1,2,4-Triazoles and 1,3,4-Thiadiazoles against different bacterial strains. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-07**Investigation and polymerization behavior of structurally different benzoxazine monomers****Renuka D. Patil<sup>1</sup>, V.P.Ubale<sup>2</sup>**

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Polybenzoxazines have been successfully synthesized from  $\beta$ -naphthol, paraformaldehyde, and four different types of diamines : tetraphenyl thiophene polybenzoxazines (TPPBOX), oxydiamine diphenyl ether polybenzoxazine (ODPBOX), sulphonyl diamines polybenzoxazine (SDPBOX), benzoic acid polybenzoxazine (BDBOX) using solvent less method. Synthesized benzoxazine and polybenzoxazine characterised by IR, <sup>1</sup>HNMR spectroscopically and thermo gravimetrically. Thermal curing of benzoxazines to give polybenzoxazines having excellent thermal stability. The percentage of char yield at 900°C is about 45% indicates high thermal stability. The polybenzoxazine (TPPBOX) contains heterocyclic moiety which shows high thermal stability.

Keywords: Benzoxazine, thermosetting polymer, thermal curing, solvent less method

Patil, R.D. and Ubale, V.P. (2022) Investigation and polymerization behavior of structurally different benzoxazine monomers. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-08**Effect of a new species *Cotugnia wankhedii* Sp. nov Cestode parasites on haematological parameters in *Gallus gallus domesticus*.****Ulka P. Aade<sup>1</sup>, Hemlata J. Chaudhari-Wankhede<sup>2</sup>**<sup>1</sup>Department Of Zoology, Government of Maharashtra Ismail Yusuf College, Jogeshwari, (E) Mumbai.<sup>2</sup>Principal, Government Science College, Gadchiroli, Maharashtra.Email - [ulkaaade1987@gmail.com](mailto:ulkaaade1987@gmail.com)

The study deals with the hematological parameters in *Gallus gallus domesticus* (Linnaeus, 1758) which is naturally infected with new species of cestode Parasite *Cotugnia wankhedii* Sp NOV. Blood samples were collected from Host *Gallus gallus Domesticus*. Out of 20 *Gallus gallus domesticus*, 16 are infected with cestode parasite. Total number of WBC, RBC, PCV, Hb, MCV, MCH, MCHC together with absolute count of differential leucocytes (Neutrophils, Monocytes, Eosinophils, Lymphocytes and Basophils) was determined. The significant increase in number of WBC, however reduction in the count of RBC HB, PVC, MCH in infected *Gallus gallus domesticus* as compared with Normal.

Keywords: Cestode parasite new Sp. *Cotugnia wankhedii*, *Gallus gallus domesticus*, Haematological parameters

Aade, U. P. and Chaudhari-Wankhede, H. J. (2022) Effect of a new species *Cotugnia wankhedii* Sp. nov Cestode parasites on haematological parameters in *Gallus gallus domesticus*. In book of abstracts, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00



Oral Presentation OP-09**Study of seasonal impact on water quality of trio confluence by physicochemical analysis : A review****Milind B. Selote<sup>1</sup>, Ganesh D. Satpute<sup>2</sup>**<sup>1</sup>Department of Chemistry, Janata Junior College, Nagbhir, Chandrapur  
Maharashtra, India.<sup>2</sup>Assistant Professor, Department of Chemistry, Govindrao Munghate Arts & Science  
College, Kurkheda, Maharashtra, IndiaEmail – [milindselote16@gmail.com](mailto:milindselote16@gmail.com)

Water is an essential natural resource for sustaining life and environment but over the last few decades the water quality of deteriorating due to its over exploitation. Water quality is essential parameter to be studied when the overall focus is sustainable development keeping mankind at the focal point. River water or groundwater are the major source of drinking water in rural as well as in urban areas and over 93% of the drinking water is met by groundwater. The study is carried out to assess the confluence water quality and their individual river quality and their suitability for drinking and other field use purpose in most rural habitations of Bhamaragad taluka of district Gadchiroli, Maharashtra, India. For this purpose, 40 samples will be collected. The quality of water usually described according to its physical, chemical and biological characteristics. Rapid industrialization and indiscriminate use of chemical fertilizers and pesticides in agriculture are causing heavy and varied pollution in aquatic environment leading to deterioration of water quality and depletion of aquatic biota. Due to use of contaminated water, human population suffers from water borne diseases. It is therefore necessary to check the water quality at regular and seasonal interval of time. Parameters that may be tested include temperature, pH, turbidity, salinity, nitrates and phosphates. An assessment of the aquatic macro invertebrates can also provide an indication of water quality.

**Keywords:** Alkalinity, Dissolved oxygen (D.O.), Physicochemical parameters, Biochemical Oxygen Demand(BOD), Water Quality Index(WQI)

Selote, M.B. and Satpute, G. D. (2022) Study of Seasonal Impact on Water Quality of Trio Confluence By Physicochemical Analysis: A Review. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-10**Green approach for one pot multicomponent synthesis using Beta cyclodextrine****Sagar Kamdi<sup>1</sup>, Sachin P. Wakade<sup>1</sup>, Aasha Chate<sup>2</sup>**<sup>1</sup>Department of Chemistry, Government Science College Gadchiroli, Maharashtra.<sup>2</sup>Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.

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We have developed an perceptive and facile approach for the synthesis of new spiro[acridine-9,30-indole]-20,4,40(10H,50H,10H)-trione and its derivatives by one-pot four component, condensation involving two equivalence of dimedone (1), substituted anilines (2), and isatin (3) catalyzed by  $\beta$ -cyclodextrin in water within short reaction time at 80 °C in good to excellent yields. We believe that this novel procedure may open the door for the easy generation of new and bioactive spiro acridine.

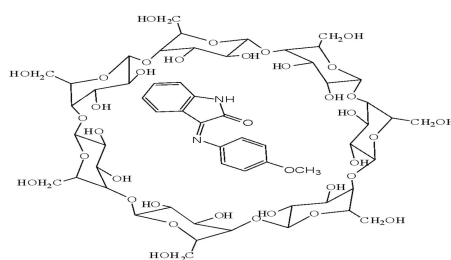
Kamdi, S., Wakade, S. P. Chate A. (2022) Green approach for one pot multicomponent synthesis using Beta cyclodextrine. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

## Oral Presentation OP-11

**Synthesis and characterization of Host-Guest inclusion complex  
between  $\beta$ -Cyclodextrin and Schiff's base****Nitin M. Ghatbandhe<sup>1</sup> Pankaj Meshram<sup>2</sup>, Ganesh satpute<sup>3</sup>**<sup>1</sup>Department of chemistry, D. K. Mahila Mahavidyalaya, Kurkheda, Gadchiroli (MS) India<sup>2</sup>Department of chemistry, Shri Lemdeo Patil Mahavidyalaya, Mandhal 441210, Nagpur (MS) India<sup>3</sup>Department of chemistry, Shri Govindrao Munghate Arts and science college, Kurkheda, Gadchiroli (MS) India  
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In the present study, the inclusion complex of Isatin schiff base (Guest) with  $\beta$ -cyclodextrin (Host) were prepared. The synthesis of host-guest inclusion complex is carried out by a co-precipitation method. The guest molecule were synthesized by condensation reaction between Isatin and p-Anisidin and were characterized using Mass spectroscopy, FT-IR and <sup>1</sup>H-NMR. The mass spectra of the guest molecule shows base peak at m/z 253, IR stretching frequency for azine (C=N) linkage at 1731  $\text{cm}^{-1}$  and <sup>1</sup>H-NMR peaks having chemical shift,  $\delta$  values between  $\delta = 3.74$ -8.87 ppm. These spectroscopic studies is in the good agreement with the structure of synthesized guest molecule. The IR and NMR spectra of Isatins Schiff base is slightly altered on forming inclusion complex with  $\beta$ -Cyclodextrin ring.

Key words: Isatin Schiff base,  $\beta$ -Cyclodextrin , Inclusion complexes, Co-precipitation method.



Inclusion complex

Ghatbandhe, N. M. Meshram P., Satpute G. (2022) Synthesis and characterization of Host-Guest inclusion complex between  $\beta$ -Cyclodextrin and Schiff's base. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-12**Study of seasonal variations of Algae from Chandrapur District (M.S)**Sangita D. NandkarDepartment of Botany, Dr. Ambedkar College of Arts, Commerce, Science  
Chandrapur (MS)Email: [dhakatesangita@gmail.com](mailto:dhakatesangita@gmail.com)

The present investigation deals with the study of seasonal variations of Algae from Rajura Taluka of Chandrapur district of Maharashtra state. The study was done during the period of 2009 to 2010 in years of data to be noted. The growth of Algal density accordingly season and temperature fluctuations have been attempted. Algal samples collected in month wise manner. Different sampling sites to be taken for this investigations. The Algal flora from polluted water bodies show the dominance of Blue Green Algae and diatoms.

Keywords: Seasonal variations, Algal samples, Sampling sites, Algal density, temperature fluctuations. Two years data, Wardha River.

Nandkar, S.D. (2022) Study of seasonal variations of Algae from Chandrapur District (M.S). *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-13**Investigations on nutraceutical potential of some wild vegetables and ethnomedicinal plants from Gadchiroli district****Shubham S. Madan, and A.N. Korpenwar**

Department of Botany, Government Science College, Gadchiroli, Maharashtra, India.

[shubhammadan166@gmail.com](mailto:shubhammadan166@gmail.com)

This study aims to evaluate the nutraceutical potential of some wild vegetables and ethnomedicinal plants. Nutraceutical is a combination of words nutrition and pharmaceuticals that provide benefits and used for prevention and treatment of diseases. According to survey 3 billion people's in the all-around world are suffering from malnourishment due to imbalanced diet. Wild Vegetables and Ethnomedicinal plants are the essential for the balanced diet since they are good source of phytonutrients and various nutraceutical compounds. Vegetables are rich source of carbohydrates, proteins, vitamins and minerals, hence known as protective foods. They also give health protection on account of the presence of secondary metabolites of therapeutic importance. Literature survey reveals that various primary and secondary metabolites found in the wild vegetables and ethnomedicinal plants have therapeutic effects on our body. Quantitative elemental analysis gives evidence about various micronutrients which helps various functions of body, growth, and disease prevention. The nutrients found in such plants helps us in boosting our immunity and fight against various diseases. Nowadays, allopathic medicines cure most of the diseases but It has severe side effects on our body and due to it we have to take such nutritious food in our diet to stay healthy and disease free.

Keywords: Nutraceuticals, Wild Vegetables, Micronutrients

Madan, S.S. and Korpenwar, A. N. (2022) Investigation on nutraceutical potential of some wild vegetables and ethnomedicinal plants from Gadchiroli district. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-14**Synthesis and biological studies of terpolymer of furfural, p – hydroxyl acetophenone and p – phynelene diamine****S. T. Peddiwar<sup>1</sup> and P. S. Jogi<sup>2</sup>**<sup>1</sup>Mohsinbhai Zaveri Mahavidyalaya, Desaijanj (Wadsa), Gadchiroli, Maharashtra.<sup>2</sup>Janta Mahavidyalaya, Chandrapur, Maharashtra.Email - [suchita.peddiwar@gmail.com](mailto:suchita.peddiwar@gmail.com)

The terpolymer FPPP was prepared by condensation of Furfural(0.1mol), p-Hydroxy acetophenone(0.2mol) and p-Phenylene diamine(0.1mol) in presence of acidic catalyst. Taking in consideration the demand of eco-friendly polymers, the synthesized polymer was screened for the biological activities like antifungal activity and antibacterial activity against gram positive and gram-negative bacteria. Antimicrobial activity of FPPP was determined against *E. coli* gram negative strain of bacteria, *S. aureus* and *B. subtilus* gram positive strain of bacteria and *A. niger*, strain of fungi by disc diffusion method and the zone of inhibition were noted. The zone of inhibition were noted as 15mm, 21mm, 20mm and 17mm for *E. coli*, *S. aureus*, *B. subtilus* and *A. niger* respectively. The obtained result indicated that FPPP has actively reduced the growth of gram positive followed by fungi and gram-negative bacteria.

Keywords: Furfural, p-Phenylene diamine, condensation, terpolymer, antimicrobial.

**Oral Presentation OP-15****Study of fresh water algal diversity from Gadchiroli taluka, district  
Gadchiroli****Yamini V. Sonule<sup>1</sup> and Amar S. Kuril<sup>1</sup>**<sup>1</sup>Department of Botany, Government Science College, Gadchiroli, Maharashtra, IndiaEmail- [amarkuril27@gmail.com](mailto:amarkuril27@gmail.com)

The phycological qualitative assessment of aquatic bodies of Gadchiroli taluka was carried out to study the diversity of various algal species. Diverse algal forms, unicellular form, multicellular filamentous and branched algae were recorded from the study sites. Microscopic examination of algae revealed the presence of 4 families consisting of 21 genera (Cyanophyceae - 07 genera, Chlorophyceae - 09 genera, Charophyceae - 02 genera and Bacillariophyceae - 03 genera). Chlorophyceae with maximum number of genera was the dominant family during the study period.

**Keywords:** phycological qualitative assessment, algal forms, Cyanophyceae, Chlorophyceae, Charophyceae, Bacillariophyceae.

Sonule, Y. V. and Kuril, A. S. (2022) Study of fresh water algal diversity from Gadchiroli taluka, district Gadchiroli. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00



**Oral Presentation OP-16****Adsorption kinetics and batch study of toxic heavy metal ions removal using bio-waste orange peel activated carbon from synthetic waste water****Santosh D. Ashtaputrey<sup>1</sup> and Prashant D. Ashtaputrey<sup>2</sup>**<sup>1</sup>Department of Chemistry, Government Science College, Gadchiroli, MS, India, 442605.<sup>2</sup>Department of Chemistry, Institute of Science, Nagpur, MS, India, 440001.[santoshashtaputrey@gmail.com](mailto:santoshashtaputrey@gmail.com)

The Adsorption technique is one of the most frequently used an effective physical method for the treatment to remove or lower the concentration of wide range of dissolved organic and inorganic pollutants present in an effluent of industries. Activated carbon (AC) frequently called as charcoal is the best adsorbent that can be used effectively for removal of large varieties of pollutants from air, soil and liquids. This research is particularly deals with the removal the toxic heavy metal ions from synthetic waste water. Because of the naturally high solubility of heavy metals in the aqueous medium and their tendency to form the soluble complexes they are easily adsorbed by the most of the living species on the earth. Therefore the gradual assimilation of large amount of heavy metals may leads to their accumulation in the human body and it causes the serious health issues. In this paper activated carbon (Charcoal) prepared from locally available orange peel bio-waste which is abbreviated as OPAC was used as an adsorbent for removing the toxic heavy metal ions from synthetic waste water. Systematic Batch experiments were performed to investigate the effect of various parameters such as initial concentration of metal ions, adsorbent dose and contact time on toxic heavy metal ions removing capacity of activated carbon from synthetic waste water sample. From the experimental results it is observed that, the prepared activated carbons are found to be more efficient towards the removal of toxic heavy metals and efficiency increases with the increase in the adsorbent dose and also with the contact time. The toxic heavy metal ions removing efficiency of OPAC300 was found to be more than OPAC400 and OPAC500 at neutral pH. The kinetic study of adsorption indicate that the experimental data fit both the Freundlich and Langmuir adsorption isotherm models and follow the pseudo-first order model better than the pseudo-second order model.

**Keywords:** Activated carbon, Orange peel, Adsorption, Toxic heavy metal ions, Batch experiment, kinetic study

Ashtaputrey S.D. and Ashtaputrey P.D. (2022) Adsorption Kinetics and Batch Study of Toxic Heavy Metal Ions removal using Bio Waste Orange Peel Activated Carbon From Synthetic Waste Water. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-17**Alterations in serum proteins and immunological proteins after infection with *H. polygyrus* in mice****Dipti Bhimrao Kadu**

Department Of Zoology, Arts and Science College, Pulgaon, Maharashtra.

Email - [diptimem@gmail.com](mailto:diptimem@gmail.com)

Initially, much of the work on immuno-adaptation was focused on mechanism by which parasites evade or inactivate specific host effector responses. In the past decade the emphasis has shifted towards understanding how parasite might directly regulate the induction of these responses, a trend that reflects the current fascination with the interaction of parasite with the regulatory cytokine network. The development of effective vaccines for the protection against nematodes has a high priority, because of serious limitations in the use of anthelmintics due to the emergence of drug-resistant parasites. The development of such vaccines depends on a detailed understanding of the host defense mechanism, identification of immunogens and target sequences, which induce protection. Nematodes occupying the gastrointestinal (GI) tract of animals shed an undefined array of chemicals into their environment. To combat effectively the potentially debilitating disease caused by infection with these organisms we must (a) define the parasite products chemically, (b) determine their ability to induce protective immunity (or to counter a protective immune response) and (c) establish their potential for the diagnosis of infection. Whilst it has become clear that “antigens” can be derived from within the parasite and from the turnover of external cuticular components, further work is necessary to establish the significance of these molecules to the survival of the parasite.

Key Words: Vaccine, *H. polygyrus*, serum protein, immunological protein.

Kadu, D. B. (2022) Alterations in serum proteins and immunological proteins after infection with *H. polygyrus* in mice. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-18**Ethnobotanical studies on orchids used by tribals of Gadchiroli district M.S. India.****Amit V. Setiya<sup>1</sup>, Sushma D. Narkhede<sup>2</sup>, N. M. Dongarwar<sup>3</sup>, Neha V. Chaudhari<sup>4</sup>**<sup>1</sup>Conservation Research And Nature Education Society, Gadchiroli (M.S.) - 442605<sup>2</sup>Department of Botany, Institute of Science, Nagpur (M.S.) -440033.<sup>3</sup>Department of Botany, RTM Nagpur University, Nagpur (M.S.) -440033.<sup>4</sup>Department of Botany, Government Science College, Gadchiroli (M.S.) – 442605Email - [amitsetiya09@rediffmail.com](mailto:amitsetiya09@rediffmail.com)

The Orchidaceae is the largest family in Monocots with nearly 22,500 species belonging under 779 genera. Gadchiroli being the most forested District in the Maharashtra State, whose approximately 76% of land is covered with beautiful forest and hills, specialized in the Tropical Dry Deciduous and Tropical Moist Deciduous forests with scattered Tropical Semi-evergreen and Dry Evergreen forests with special influence of Western Ghats and Eastern Ghats. The present work becomes very special as it provides first-hand information on use of Orchids in Ethnoveterinary practices which was never been documented. The paper enumerates six genera of Orchidaceae with their unique Ethnobotanical uses documented from the tribes inhabiting Gadchiroli District.

Keywords: Ethnobotany, Ethnoveterinary, Orchids.

Setiya A.V., Narkhede S.D., Dongarwar N.M., Chaudhari N.V. (2022) Ethnobotanical studies on orchids used by tribals of Gadchiroli district M.S. India.. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-19**A study on acoustic and transport properties of Potassium Sulphate and water at various concentration and temperature.****Pooja R. Sonune, Urvashi P. Manik, Paritosh L. Mishra**Post Graduate Teaching Department of Physics, Sardar Patel Mahavidyalaya,  
Chandrapur-442401, India.Email - [poojasonune28@gmail.com](mailto:poojasonune28@gmail.com)

The effect of structure making and breaking of solute in solvent components and their molecular interaction was evaluated for the solution of aqueous potassium sulphate at various concentrations and temperatures. The different acoustical properties have been investigated from the ultrasonic velocity, density and viscosity {such as – Latent heat vaporization ( $L_v$ ), Gibb's free energy ( $\Delta G$ ), Entropy ( $\Delta S$ ), Ultrasonic attenuation ( $\alpha$ ) and Isothermal compressibility ( $\beta_i$ )}. The results show that a greater association exist between the water and potassium sulphate at higher concentration. This indicates the structure making tendency of solute in a solvent. This kind of study explores interesting information given various aspects of agricultural science or agro-physics.

Keywords: Acoustical parameters, density, potassium sulphate, ultrasonic velocity, viscosity and water

Sonune, P. R. Manik, U. P., Mishra, P. P (2022) A study on acoustic and transport properties of Potassium Sulphate and water at various concentration and temperature. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-20**Aerobiology of angiospermic pollen grains at Doriganj of district Saran, Bihar on the basis of environmental pollution and pollen allergy.****Naira Nayab<sup>1</sup> and Md Anzer Alam<sup>2</sup>**<sup>1</sup>Research Scholar, Department Of Botany, Jai Prakash University, Chhapra Bihar.<sup>2</sup>Associate professor Ganga Singh College, Jai Prakash University, Chhapra Bihar.E mai - [nayabnaira@gmail.com](mailto:nayabnaira@gmail.com)

Beside toxic gases and radiations environmental pollution also effected badly through the airborne microscopic particles of fungal spores, pollen grains, dust particulate matter and molds. They menace the life functioning of the man, animal and plant. People of today's era are conscious to keep the climate free from pollution. Pollen grains are the male gametophyte of seed plants. Sizes of pollen grains varies from 3mm to 230 mm. Airborne pollen grains range from 10 mm to 100 mm or a little more. Aeroallergens are composed of a wide variety of material originating from different sources. The most common aeroallergens are mold, pollen grains, house dust mites, cosmetics, Insecticides...etc. Pollen grains and spores are considered to be the major component of the aeroallergens found suspended in the air. They cause widespread upper respiratory tract and naso-bronchial allergy with manifestations like asthma, seasonal rhinitis, and various types of bronchial troubles... etc. The aim of this research work is to correlate the atmospheric pollen with the Incidence of respiratory allergic disorders to prepare a pollen atlas with a pollen key of the flora of Doriganj and the adjoining areas which provided sufficient indication for the identification of airborne pollen grains sometimes even upto specific level. The examination comprises the following steps Botanical examination, Biochemical examination and clinical examination. The above data is expected to be of great significance to the allergy clinics in the detection of causal allergens and incidence of bronchial asthma, in this region.

Keywords - Aeroallergens, Environmental pollution, Respiratory diseases

Nayab, N. and Alam, Md A. (2022) Aerobiology of angiospermic pollen grains at Doriganj of district Saran, Bihar on the basis of environmental pollution and pollen allergy. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-21**Ultrasonic studies on molecular interaction of KNO<sub>3</sub> in aqueous solution at various concentrations and temperature****Neha Pathan, Urvashi Manik, Paritosh Mishra**Post Graduate Teaching Department of Physics, Sardar Patel Mahavidyalaya  
Chandrapur-442401, India.Email - [nehapatan0204@gmail.com](mailto:nehapatan0204@gmail.com)

In the present study ultrasonic velocity, viscosity and density have been measured at frequency 2MHz of KNO<sub>3</sub> with water in the concentration range (0 to 2.0 M) at 283.15K to 298.15K using ultrasonic interferometer technique. The measured value of ultrasonic velocity, viscosity and density have been used to estimate thermodynamic and acoustical parameters such as free volume, free length, Rao's constant, Wada constant, internal pressure and acoustic impedance, cohesive energy with a view to investigate the nature and strength of molecular interaction of potassium nitrate with water. The obtained result support the occurrence of complex formation, molecular association through intermolecular hydrogen bonding in aqueous solution.

Keywords - KNO<sub>3</sub>, cohesive energy, free length, internal pressure

Pathan, N., Manik U, Mishra P. (2022) Ultrasonic studies on molecular interaction of KNO<sub>3</sub> in aqueous solution at various concentrations and temperature. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-22**Determination of temperatures in inverse thermoelastic problem of a hollow elliptical cylinder****Ujwala Beldar<sup>1</sup>, Sunil D. Bagde<sup>2</sup>**<sup>1</sup>Research Scholar , Department of Mathematics, Gondwana University, Gadchiroli- 442605, India<sup>2</sup>Department of Mathematics, Gondwana University, Gadchiroli , MIDC Road Complex, Gadchiroli- 442605, IndiaEmail - [beldaru19@gmail.com](mailto:beldaru19@gmail.com)

The present paper is concerned with inverse thermoelastic problem of a hollow elliptical cylinder and determined the temperature distribution and unknown temperature in a hollow elliptical cylinder at point  $\chi=a_0$  for time ( $t > 0$ ) with the help of Mathieu function and integral transform technique.

Key words - Mathieu function, Inverse thermoelastic problem, Marchi-Fasulo transform, Fourier Transform.

Beldar U. and Bagde S. D. (2022) Determination of temperatures in inverse thermoelastic problem of a hollow elliptical cylinder. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-23**Avifaunal diversity of Chandankhedi lake near Ashti in Chamorshi taluka, Gadchiroli District (MS) India****Maheshkumar Seelamwar<sup>1</sup> and Pankaj Chavhan<sup>2</sup>**<sup>1</sup>Department of Zoology, Shri Sadguru Saibaba Science and Commerce College, Ashti, Maharashtra, India.<sup>2</sup>Department of Zoology. S.J.S.P.M Arts, Commerce and Science College, Dhanora, Maharashtra, India.Email.id - [maheshseelamwar@gmail.com](mailto:maheshseelamwar@gmail.com)

The present investigation on avifaunal diversity has been carried out on Chandankhedi lake from March 2020 to February 2022 which is located near Ashti in Chamorshi Taluka, Gadchiroli district (MS) India. The lake is enriched with large number of flora and fauna which attract the native as well as migratory birds. The observations of flora, fauna and invertebrate surveys suggest that the entire lake basin highly productive and conducive to all kinds of avifauna. The surveys were conducted twice a month during a day time. Total 43 species were recorded belonging to 10 different orders and 27 different families during the study period among which family Ardeidae is found to be most dominant family of birds. Out of 43 species, 33 species were Residents (76%), 06 species were winter visitors (14%), 02 species were summer visitor (5%) and 02 species were regional migratory (5%). Out of 43 species, 27 species were very common, 04 species were common, 10 species were rare and 02 species were occasional. The maximum bird species were sighted during winter followed by summer and monsoon season.

Keywords - Birds, Diversity, Ashti.

Seelamwar, M. and Chavan, P. (2022) Avifaunal diversity of Chandankhedi lake near Ashti in Chamorshi taluka, Gadchiroli District (MS) India. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00



Oral Presentation OP-24**Distribution of snakes in Eastern region of Maharashtra, India****Rupali Arvind Patil-Bhagat and A. K. Gawande**

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The current study was conducted on snakes in the Eastern Region of Maharashtra state (India) from June to July 2018. During rescue operation, we discovered two snakes in Maharashtra's eastern region: Ramtek Tahsil in Nagpur district and Tadoba in Chandrapur district. Cold-blooded reptiles have a body temperature that fluctuates with the outside temperature. They also have a lower metabolic rate than mammals or birds of comparable size, which means they produce less heat. Due to the lack of sweat glands, they have insufficient bodily insulation and cooling systems, although having a high ability to regulate temperature. Ramtek Tehsil in Nagpur district, Maharashtra's eastern region is known for its forest and rice crop growing areas (20°58'02.4"N 79°08'02.3"E) and Moharli gate, Tadoba (19° 58' 13.1664" N and 79° 18' 12.0960" E.) in Chandrapur district are located in the eastern state of Maharashtra. The *Boiga trigonata* (rare) and *Xenochrophis vittatus* (Commonly found) specie in Nagpur which is part of Eastern Maharashtra. Based on animal rescue, we herein document 2 species of snakes in 01 family from Nagpur and Chandrapur District, Maharashtra.

Keywords - Distribution, Reptiles, cold blooded, Nagpur, Eastern area

Patil-Bhagat, R. A. and A. K. Gawande (2022) Distribution of snakes in Eastern region of Maharashtra, India. *In book of abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

Oral Presentation OP-25**Photoluminescence of  $\text{Ce}^{3+}$  in alkaline earth Bromides****Dipti K. Ingole**

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This paper mainly concern with the study of photoluminescence properties of  $\text{Ce}^{3+}$  doped alkaline earth bromides. Most commonly observed emission is characteristic of 5d-4f transitions which are parity and spin-allowed so that PL intensities are appreciable and lifetimes of fluorescence are in the range of 10 – 60 ns.  $\text{Ce}^{3+}$  doped phosphors are thus useful where rapid decay times are required e.g. in time of flight camera and scintillators.  $\text{Ce}^{3+}$  emission has been studied in a large number of hosts. However, there is not much information available on PL of  $\text{Ce}^{3+}$  in bromide hosts so it was thus decided to study  $\text{Ce}^{3+}$  luminescence in  $\text{MgBr}_2$  and  $\text{CaBr}_2$  doped with different concentrations of  $\text{Ce}^{3+}$  ion which were prepared by simple Wet Chemical Method and photoluminescence was studied. In these hosts,  $\text{Ce}^{3+}$  ion was found to be an efficient luminescence centre emitting in near UV region 330-400 nm.  $\text{CaBr}_2$  has orthorhombic structure with space group  $\text{Pnnm}(58)$ . For  $\text{CaBr}_2$  recorded emission is at  $\lambda=374$  nm with  $I=231$  and shoulder is at  $\lambda=352.6$ . Excitation position is found to be at  $\lambda=330.2\text{nm}$  with shoulders at  $\lambda=256.8\text{nm}$ ,  $275\text{nm}$ ,  $261\text{nm}$ ,  $241\text{nm}$  and  $232\text{nm}$ .  $\text{MgBr}_2$  crystallizes in the trigonal space group  $\text{P-3m1}$  with the Mg atom on a site with 3m symmetry and the Br atom on a site with m symmetry within the structure, the bromide anions are hexagonally close-packed, while the  $\text{Mg}^{2+}$  cations occupy all of the octahedral holes between alternate layers of close packed anions. For  $\text{MgBr}_2$  the prominent band is at  $\lambda=377.2\text{nm}$  with shoulders at  $\lambda=372.6\text{nm}$  and  $406\text{nm}$ . Excitation is at  $\lambda=342\text{nm}$ . Shoulders are at  $\lambda=294.4$ ,  $274$ ,  $263$  and  $243.8\text{nm}$ .

Keywords -  $\text{Ce}^{3+}$  ; phosphors; chemical synthesis; luminescence; elpasolite

Ingole, D. K. (2022) Photoluminescence of  $\text{Ce}^{3+}$  in alkaline earth Bromides. In book of *abstracts*, National Scientific Conference on Multidisciplinary Research organized by Government Science College, Gadchiroli in association with Indian Science Congress Association Amaravati Chapter on 7<sup>th</sup> and 8<sup>th</sup> April 2022 p. 00

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PP-06	$\text{Sm}^{3+}$ Ions doped $\text{ZnAl}_{12}\text{O}_{19}$ Phosphor : Luminescence properties	<u>R. M. Yerojwar</u> , N.S. Kokode, C.M. Nandanwar.	

**Poster Presentation PP - 01****Environmental determinants of freshwater fish diversity and assemblage structure in semi-arid regions of central India**Mandar S. Paingankar<sup>1</sup>, Rajeev Raghavan<sup>2</sup>, Neelesh Dahanukar<sup>3</sup><sup>1</sup> Department of Zoology, Government Science College, Gadchiroli, Maharashtra, India<sup>2</sup> Department of Fisheries Resource Management, Kerala University of Fisheries and Ocean Studies (KUFOS), Kochi, Kerala, India<sup>3</sup> Department of Life Sciences, Shiv Nadar University, NH - 91, Tehsil Dadri, Gautam Buddha Nagar, Uttar Pradesh – 201314Email – [mandarpaingankar@gmail.com](mailto:mandarpaingankar@gmail.com)

Quality of habitats is an important factor influencing diversity, and structuring of species assemblages in freshwater ecosystems. We determine critical environmental variables from freshwater sites in the semi-arid regions of central India with an aim to understand their influence on fish communities. Our surveys revealed the occurrence of 63 fish species belonging to 22 families and 49 genera, which the species accumulation curve predicted to be an underestimate. Riverine habitats showed significantly greater species richness as compared to ponds. More than a third of the species showed high association index of co-occurrence suggesting that they formed assemblages. In multiple regression, total number of species showed a significant positive relationship with dissolved oxygen and sulphate concentration, and a negative relationship with free carbon dioxide. Canonical correspondence analysis and canonical correlation analysis suggested a statistically significant association between environmental parameters and occurrence of different species and their assemblages respectively. Our study is the first effort to understand how freshwater fish diversity and assemblages are affected by environmental parameters in drier semi-arid parts of the Indian subcontinent. Given that the freshwater habitats in this region are under stress from human modifications, our baseline study will contribute towards conservation management of freshwater fishes.

**Keywords:** Canonical correspondence analysis; Species assemblages; Species accumulation; Ichthyofauna; Maharashtra

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**Poster Presentation PP - 02****Deciphering the arginine and lysine protein methylation pattern in *Drosophila* cells in response to Nitric oxide stress****Mandar Paingankar<sup>1,2</sup> Deepti Deobagkar<sup>2,3</sup>**<sup>1</sup>Department of Zoology, Government Science College, Chamorshi Road, Gadchiroli - 442605, Maharashtra, India.<sup>2</sup>Molecular Biology Research Laboratory, Centre for Advanced Studies, Department of Zoology, Savitribai Phule Pune University, Pune - 411 007, India.<sup>3</sup>ISRO Chair Professor, ISRO Space and technology Cell, Savitribai Phule Pune University, Pune - 411 007, India.Email- [mandarpaingankar@gmail.com](mailto:mandarpaingankar@gmail.com)

The pivotal role of protein methylation in various cellular functions has been well documented and it's potential in designing the novel strategies for control of cancer and diseases has been well studied. With respect to a wide range of functions in physiology and immunology of mammals, the interrelationships of nitric oxide and methylation of protein needs to be deciphered. Identification of methylated proteins in normal and nitric oxide (NO) stress conditions to improve our understanding of the methylated proteome and its interdependence with nitric oxide. We employed immune-precipitation using multiple anti-methyl arginine and anti-methyl lysine antibodies followed by LC MS/MS analysis to study the protein methylation in normal and different NO stresses conditions in *Drosophila* cells. A total of 2307 proteins with methylated arginine and 1687 with methylated lysine were identified in *Drosophila* cells in different stress conditions of NO. The similarities and difference in methylated proteome of control, aminoguanidine hemisulfate (AGHS) and N6, N6-Dimethyl-L-arginine, Dihydrochloride (NAME) treated *Drosophila* cells at different time points was compared. The GO and KEGG analysis of identified proteins revealed that processes such as central metabolism, ribosomal function and nucleic acid binding related functions are modulated under NO stress. The identified methylated proteome provided valuable insights in to interdependence of protein methylation and NO stress.

**Keywords:** Aminoguanidine hemisulfate (AGHS), *Drosophila* cells, Immuno-precipitation, LC MS/MS, N6, N6-Dimethyl-L-arginine, Dihydrochloride (NAME), Nitric oxide stress, Protein methylation.

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**Poster Presentation PP - 03****Synthesis & Characterization of  $\text{Ba}_3\text{Ca}_3(\text{PO}_4)_4:\text{Dy}^{3+}$  phosphor for white light-emitting diodes****Chandrasya M. Nandanwar<sup>1</sup>, N.S. Kokode<sup>2</sup>, A.N. Yerpude<sup>3</sup>**<sup>1</sup>Department of Physics, N.H. College, Bramhapuri, Dist-Chandrapur, India<sup>2</sup>N. H. College, Bramhapuri, Dist. Chandrapur 441206, India<sup>3</sup>Department of Physics, N.H. College, Bramhapuri, Dist-Chandrapur, India**Email - [chandrasyanandanwar@gmail.com](mailto:chandrasyanandanwar@gmail.com)**

In order to make the  $\text{Ba}_3\text{Ca}_3(\text{PO}_4)_4:\text{Dy}^{3+}$  phosphors for w-LEDs, we used a standard wet chemical technique. The luminescence characteristics of the phosphors were investigated. The phosphor could be efficiently excited by the 350 nm. In  $\text{Ba}_3\text{Ca}_3(\text{PO}_4)_4:\text{Dy}^{3+}$  phosphors, emission peaks located at blue (481 nm) and yellow (572 nm) result from  $\text{Dy}^{3+}$  transitions  $^4\text{F}_{9/2} \rightarrow ^6\text{H}_{15/2}$  and  $^4\text{F}_{9/2} \rightarrow ^6\text{H}_{13/2}$ , respectively. When the concentration of  $\text{Dy}^{3+}$  was increased, the emission intensity of the  $\text{Ba}_3\text{Ca}_3(\text{PO}_4)_4:\text{Dy}^{3+}$  phosphor increased at first and then decreased.  $\text{Ba}_3\text{Ca}_3(\text{PO}_4)_4:\text{Dy}^{3+}$  possesses chromaticity coordinates that are very close to typical white light. The results indicate that  $\text{Ba}_3\text{Ca}_3(\text{PO}_4)_4:\text{Dy}^{3+}$  may be a potential application to white LEDs.

**Keywords:** w-LED, Phosphors, Wet chemical synthesis, Photoluminescence

**Poster Presentation PP - 04****Seasonal Variations in Airborne Cladosporium and Alternaria spp. Conidia in Nagbhid (MS).****Aruna N. Shende<sup>1</sup>, Anil N. Korpenwar<sup>2</sup> and R. R Dahegaonkar<sup>3</sup>**<sup>1</sup>D.K.M. Mahavidyalaya, Kurkheda.<sup>2</sup>RMG Arts and Science College, Nagbhid.<sup>3</sup>Dr. Ambedkar College of Arts, comm., & Science, Chandrapur.Email - [shendearuna3@gmail.com](mailto:shendearuna3@gmail.com)

The airborne fungal spores Cladosporium and Alternaria known as most allergenic spores have been counted by using a volumetric Tilak Air Sampler at three different sampling sites during two consecutive year. The Daily, monthly and annual variations in spores/m<sup>3</sup> of Cladosporium and Alternaria were recorded. During the study period, a total of 12,231 spores/m<sup>3</sup> belonging to Cladosporium and Alternaria genera were recorded. Relationship between airborne fungal conidia presence and meteorological parameters and seasonal variations have been statistically investigated. Thus, a Friedmann test was performed followed by a Pearson Correlation Analysis and allergenic survey of poultry workers, visitors and peoples from nearby locality was taken during study period. The effect of rainfall, temperature and wind velocity on conidia of Cladosporium and Alternaria numbers were non-significant according to sites and months ( $p > 0.06$ ), but the effect of relative humidity on the conidia of Cladosporium and Alternaria numbers were significant ( $p < 0.02$ ). Airborne conidia concentrations reached to their highest levels in May month.

**Keywords:** - Seasonal variation. Airborne fungal spores, Conidia, Allergens, Meteorological parameters.

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**Poster Presentation PP - 05****Review on Bioactive Compounds from Plants as an EPI to Combat Antibiotic Resistance****Praveenkumar Patre<sup>1</sup>, Vijay Wadhai<sup>2</sup>**<sup>1</sup>Department of Microbiology, Mohsinbhai Zaweri Mahavidalaya Desaiganj, Wadsa, Gadchiroli, (M.S.), India.<sup>2</sup>Centre for Higher Learning Research and Specialised Study in Microbiology, Sardar Patel Mahavidalaya, Chandrapur, (M.S.), India.E-Mail: [praveen.patre7@gmail.com](mailto:praveen.patre7@gmail.com)

Multidrug resistance among bacteria has become a hot topic in recent years, necessitating the development of possible compounds to combat the problem. Over-expression of efflux pumps is one of the most important pathways for gaining resistance among several others. Efflux pumps can efflux a wide range of structurally unrelated medications, rendering them ineffective, emphasizing the necessity of efflux pump inhibitors. In this paper, we evaluate the research on plant-derived efflux pump inhibitors (EPIs), which can help current antibiotics regain their effectiveness. The identification of new classes of natural EPIs necessitates additional research to see whether they can function in tandem with current antibiotics.

**KEYWORDS;** Bacterial efflux pumps, EPI, MDR, Antibiotic resistance; Plant Bioactive compounds; Secondary active transporter

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**Poster Presentation PP - 06****Sm<sup>3+</sup> Ions doped ZnAl<sub>12</sub>O<sub>19</sub> Phosphor : Luminescence properties****R. M. Yerojwar<sup>1</sup>, N. S. Kokode<sup>2</sup>, C. M. Nandanwar<sup>2</sup>**<sup>1</sup> Mohsinbhai Zaweri Mahavidyalaya, Desaiganj(Wadsa), Gondwana University,  
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By using combustion synthesis, Samarium ions activated ZnAl<sub>12</sub>O<sub>19</sub> phosphors were prepared for the first time. X-Ray Diffraction (XRD) and Photoluminescence (PL) techniques were used to characterize the powder samples. XRD was used to determine the crystal structure of the produced ZnAl<sub>12</sub>O<sub>19</sub> host phosphors. The SEM technique revealed the structured character of the produced materials. The PL emission spectra of Sm<sup>3+</sup> activated ZnAl<sub>12</sub>O<sub>19</sub> phosphor exhibit a prominent emission peak at 564 nm and 600 nm, which corresponds to the <sup>4</sup>G<sub>5/2</sub> → <sup>6</sup>H<sub>5/2</sub>, and <sup>4</sup>G<sub>5/2</sub> → <sup>6</sup>H<sub>7/2</sub> transitions respectively, when excited at excitation wavelength of 405 nm. As a result, these manufactured phosphors could be used in display devices and solid-state lighting.

Keywords - photoluminescence, XRD, phosphors, combustion method.

