# SOUVENIR

ITM UNIVERSITY
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"CELEBRATING DREAMS"

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ITM GROUP
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8th International Conference on

# TECHNOLOGY, INNOVATION AND MANAGEMENT FOR SUSTAINABLE DEVELOPMENT

# TIMS-2020

(Environmental Sustainability with Ecological, Economical, Technological and Social Perspective)

FEBRUARY 19-20, 2020

*Sponsored by*

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8TH INTERNATIONAL CONFERENCE ON TECHNOLOGY, INNOVATION AND MANAGEMENT FOR SUSTAINABLE DEVELOPMENT
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## ABOUT GWALIOR

Gwalior is a historical city in the heart of india, situated in the State of Madhya Pradesh, 120 Km from Agra (The city of Taj Mahal) and 317 Km from Delhi. It is well connected with Delhi, Bhopal, Mumbai, Bangalore and Hyderabad by train and road, and by air from Delhi and Mumbai. Gwalior, known as city of music, has perhaps the richest musical tradition among all the cities in this great country starting from Tansen, Baijubabra, Hassukhan, Haddukhan, Krishnarao Pandit, Bala Saheb Puchhwale, Chote Bahyya Puchhwale, Bande Ali Khan, Shankar Rao Pandit and to come to the living legends Malini Rajurkar, Ustad Amjad Ali Khan, the list is endless. The legendary musician Tansen who belonged to Gwalior was recognized as one the nine jewels of Emperor Akbar's court. Most famous and memorable landmarks include Gwalior Fort, the living palace of Scindia's, Jai Vilas Palace, the Tomb of the famous musician Tansen and museums. Agra, the city of Taj, is 110 Kms from Gwalior and 1.5 hours journey by express trains. The world famous Khajuraho group of temples, depicting all facets of life, are 4 hours journey by road. Mitawali & Padavali has a group of 108 ruins of temples and is 20 Kms from Gwalior. Orchha is 100 Kms from Gwalior and is a treat for weekend trips as the village still carries old time feel with palaces, temples, cenotaphs and ruins along the banks of Betwa River.

## ABOUT ITM UNIVERSITY

ITM University Gwalior is situated in a picturesque campus spread over 125 acres along the foot hills of Vindhyachal ranges. The campus is on AH-43 of National Highway-3, which is developed as a four lane 'Express Way' connecting the north & east of India. The main track of Indian Railways connecting Mumbai, Chennai, Hyderabad, Bangalore, Indore and Pune runs along this highway. Gwalior is also connected by Air from Mumbai, Hyderabad, Bangalore, Jammu and Calcutta.

The University is a multidisciplinary University with an aim to foster highest quality teaching and research across the academic spectrum. The University has been crowned with more than 30 awards and ranked 24 times among the best Universities of the country by government and other agencies. The University was ranked 32nd in Management and 58th in Engineering programs respectively by the National Institutional Ranking Framework (NIRF), Ministry of Human Resource Development (MHRD) Government of India in 2016. The University is also accredited by NAAC.

The University is approved by the concerned regulatory bodies of the Govt. of India & the state of Madhya Pradesh, to run courses in Agriculture, Architecture, Arts & Design, Commerce, Computer Applications, Engineering, Fine Arts, Journalism, Law, Management, Nursing, Pharmacy, Physical Education, Sciences, and Teacher Education. The University is at the forefront of learning, teaching & research and is a leader in many different fields. It seeks to sustain and enhance its excellence as an institution of higher learning through outstanding teaching and world class societies it serves.

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Shri Ramashankar Singh, Founder Chancellor, ITM University Gwalior

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## CONVENER

Dr. Richa Kothari



8TH INTERNATIONAL CONFERENCE ON TECHNOLOGY, INNOVATION AND MANAGEMENT FOR SUSTAINABLE DEVELOPMENT
FEBRUARY 19-20, 2020

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## CO-ORGANIZING SECRETARIES

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## ABOUT THE CONFERENCE

Today society needs the physical development and institutional operating practices that meet the needs of present users without depected resources base of future generations. In such circumstances sustainable practices may act as a bridge between ecological, human, and economic health and vitality. However, there is no mathematical theory embodying these concepts, although one would be immensely valuable in humanity's efforts to manage the environment. Thus, the concept of sustainability applies to integrated systems comprising humans and the rest of nature; the structures and operation of the human component (society, economy, health, agriculture, law, etc.) must be such that they reinforce the persistence of the structures and operation of the natural component.

Most developing countries enjoyed a relatively high level of economic growth over the last three decades accompanied by rapid industrialization, urbanization, and agricultural intensification. This growth relied extensively on the country's abundant and diverse natural resources. It has led to the degradation of land and water quality, caused the loss of natural habitats, and generated increasing levels of air and water pollution. Humanity stands at a defining moment in history. We are confronted

with a perpetuation of disparities between and within nations, a worsening of poverty, hunger, ill health and illiteracy, and the continuing deterioration of the ecosystems on which we depend for our well-being. However, integration of environment and development concerns and greater attention to them will lead to the fulfillment of basic needs, improved living standards for all, better protected and managed ecosystems and a safer, more prosperous future. It is important that the sustainable development is for the future of sustainability of natural resources and environment as well as the people's livelihood and well-being.

It's time to discuss and evolve a balanced approach, ensuring economic growth and development to meet aspirations of billions, while making sure that we leave a better world for our future generations in terms of environment and natural resources. India is in a unique position to lead this movement to restore balance between development and environment and also where water and energy efficiency was ingrained in life style, engineering concepts and architecture. India is the second most populous country in the world, with one of the fastest growing economy, having great demands on energy and natural resources to ensure a rapid pace of development, and possessing a vast resource of traditional wisdom and boasting of a rich heritage and culture which always advocated the idea of living in harmony with nature. Therefore, one of the challenges of sustainability research lies in linking measures of ecosystem functioning to the structure and operation of the associated social system.

8th International conference on ''Technology, Innovation and Management for Sustainable Development" (TIMS-2020) being organized with the theme Environmental Sustainability with Ecological, Economical, Technological and Social Perspective is aimed at bringing together experts and specialists in food, health, pharmacy, agriculture, water, climate change and energy, development partners, civil societies, academia, and environmentalists. The Conference gives planners and policymakers an opportunity to listen attentively and act on the recommendations speedily to meet the challenges of this decade and beyond.

## OBJECTIVES

- To discuss the current perspectives of sustainable development in developed and developing economies.
- To provide a platform to technocrats, experts and academicians from different countries for presenting their innovative and constructive ideas at international level.
- To conserve and enhance resource base with the help of new and innovative technologies.
- To create innovative technologies and reorienting existing technologies for sustainable development and discuss future solutions for designing of green and safer environment.
- To formulate a holistic approach in decision making on basis of environment economies and technology options.
- To generate research and disseminate knowledge about sustainable development.



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# MESSAGE

सत्यमेव जयते

भारत के उपराष्ट्रपति
VICE-PRESIDENT OF INDIA

**MESSAGE**

I am happy to know that ITM University, Gwalior is organizing its 8th International Conference on Technology Innovation and Management for Sustainable Development (TIMS-2020), from February 19 – 20, 2020.

Sustainable development is the watchword for the 21st century. I believe that continuous innovation is a necessary precondition for sustainable development. Conferences such as TIMS-2020 will act as force-multipliers, bringing together practitioners and experts from different fields to share their knowledge and experiences and help evolve new paradigms for sustainability.

I am happy to know ITM University, Gwalior, has earned a reputation for excellence. I am hopeful that the University will continue to set higher benchmarks for the quality of research and training it offers and will quickly establish itself as an important hub of innovative learning.

I congratulate the staff and students of the University for organizing this Conference. I hope that many more such initiatives that promote scientific thinking and innovation will be undertaken by this institution, in the time to come.

I wish the Conference all success.

(M. Venkaiah Naidu)

**New Delhi**
**24th January, 2020.**



8TH INTERNATIONAL CONFERENCE ON TECHNOLOGY, INNOVATION AND MANAGEMENT FOR SUSTAINABLE DEVELOPMENT
FEBRUARY 19-20, 2020

नरेन्द्र सिंह तोमर
NARENDRA SINGH TOMAR

सत्यमेव जयते

कृषि एवं किसान कल्याण,
ग्रामीण विकास तथा पंचायती राज मंत्री
भारत सरकार
कृषि भवन, नई दिल्ली

MINISTER OF AGRICULTURE & FARMER WELFARE,
RURAL DEVELOPMENT AND PANCHAYATI RAJ
GOVERNMENT OF INDIA
KRISHI BHAWAN, NEW DELHI

**MESSAGE**

It gives me immense pleasure to know that the ITM University Gwalior is going to organize its **8th International Conference on Technology Innovation and Management for Sustainable Development (TIMS - 2020)** on 19-20 February, 2020.

It is well known that this is a multidisciplinary University with an international reputation for the quality of its research and teaching across the academic spectrum. I have been told that the University has received more than 20 awards and has been adjudged as the "Best University Providing Placements & Entrepreneurship in India". It is understood to be the only private University in M.P. which is accredited by the ICAR for offering undergraduate program in Agriculture.

I hope the University will continue to provide students with the opportunities to develop personal and social skills, along with academic curriculum to inculcate in them a wide range of learning experiences, a scientific outlook and all human virtues.

I extend my best wishes for an amazing success of the 8th International Conference as well as the Award Ceremony.

7/1/20

**(Narendra Singh Tomar)**

Office: 'G' Wing, Ground Floor, Krishi Bhawan, New Delhi- 110001, Tel.: 011-23782373, 23782327 Fax: 011-23385876
Resi.: 3 Krishna Menon Marg, New Delhi-110001, Ph.: 011-23794697 / 98, Fax: 011-23794696

# MESSAGE FROM CHANCELLOR
## ITM UNIVERSITY GWALIOR

The foundation stones of ITM University are laid on the essence of academic pursuit and excellence. Excellence in any work can be achieved with utmost dedication, hard work, and perseverance. We, at ITM, have made this dictum our motto and our way of life in every single activity in the campus.

Research and development forms the backbone of our curriculum at ITM. The staff and students are engaged in various path-breaking innovative research activities all throughout the year. Every school of our University organizes conferences and seminars frequently on contemporary and relevant topics in order to facilitate research in those areas which will lead to necessary metamorphosis in the academia as well.

The School of Sciences at ITM, right from its inception, has been active in research and innovation and has setup an ambient academic environment for its students and research scholars. With the commitment of highly qualified and efficient staff, the school endeavors vigorously to make a mark in the field of research and development. The 8th International Conference on Technology Innovation and Management for Sustainable Development (TIMS-2020) at ITM University Gwalior scheduled on February 19-20, 2020 is another venture to provide a platform for academicians – teachers, students, research scholars, and industry personnel – globally to discuss on contemporary trends and innovations in Sciences. All the papers presented in the conference will be submitted for inclusion in reputed journals.

I wish the conference all the very best and urge all participants to brainstorm on the various thrust areas of the conference. I also wish all of you a happy stay in our campus and look forward to your participation in various events in the campus.

**Mrs. Ruchi Singh Chauhan**



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# MESSAGE FROM PRO CHANCELLOR
## ITM UNIVERSITY GWALIOR

A conference is a place where true meeting of minds happen. Researchers, who would have done a good deal of thinking about their idea, will come forward and share their thoughts with fellow researchers. The beauty of a conference such as TIMS-2020 is that it allows such exchanges which in turn will ignite more ideas and ways of improving the presented ideas.

The biggest beneficiaries hence will be the attendees who truly participate. I thank and congratulate the organizing team and ITM University for enabling innovation through a conference. With the blurred boundaries between domains, technologies getting merged and less compelling technologies practically disappearing, we need to be updated on how our world is evolving and changing. We can use of TIMS-2020 to add value to ourselves, our research and our communities.

Wish you all a great conference and enjoy the city of Raja Mansingh (Gwalior).

**Dr. Daulat Singh Chauhan**

## MESSAGE FROM VICE CHANCELLOR
ITM UNIVERSITY GWALIOR

Scientific conferences play an important role in expanding the scope of research. Through conferences and seminars, the researchers also get chance to build network amongst those working in similar and allied fields and exchange recent advances. ITM University Gwalior has always been actively engaged in organizing several events since inception.

I am delighted to know that the School of Sciences of ITM University Gwalior is organizing 8th International Conference on Technology, Innovation and Management for Sustainable Development (TIMS-2020) during Feb 19-20, 2020. Being a truly multi-disciplinary in nature, this conference will bring all the researchers and students of different fields at one platform and enable them to enhance the collaborations and scope of their research. I hope that this conference would certainly induce innovative ideas and encourage young researchers to venture into unexplored areas of Science and Technology.

I congratulate all the members of the advisory Committee for their guidance and the members of the organizing committee for their hard work in organizing this unique conference. I convey my best wishes for a grand success of TIMS-2020.

**Dr. Kamal Kant Dwivedi**



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## MESSAGE FROM REGISTRAR
ITM UNIVERSITY GWALIOR

The science and engineering research conducted in academic institutions, industry, R & D Laboratories and elsewhere plays a critical role in raising our standard of living, creating jobs, improving health andproviding for national security and development. I am extremely happy to note that School of Sciences, ITM University is organizing 8th International Conference on Technology Innovation and Management for Sustainable Development (TIMS-2020) at ITM University Gwalior scheduled on February 19-20, 2020.

I am sure that the conference of this type will inculcate the much needed research culture among the students and teachers and trigger interactions among researchers to exchange the ideas of recent advances in the areas of Sciences.

I wish the conference a grand success.

**Dr. Omveer Singh**

## MESSAGE FROM DEAN
SCHOOL OF SCIENCES, ITM UNIVERSITY GWALIOR

It gives me immense pleasure to present you all "The 8th International Conference on Technology Innovation and Management for Sustainable Development (TIMS - 2020) is intended to create an open space networking and exchange of information and knowledge on human habitat, health, agriculture and economy innovations and their application in different domains in agriculture and sustainable development with a bearing on research and development.

Bridging the gaps in science, technology and innovation is a key to enhance institution's capacity to use more & more innovation technologies in different sectors, particularly in agriculture and human health. The conference is organized with the support of SERB, DST New Delhi, and the hard work of management, faculty, staff and students. Bridging the gaps in science, technology and innovation is a key to enhance institution's capacity to use more & more innovation technologies in different sectors, particularly in agriculture and human health. During two days, presentations, discussions, and side events will inspire new ideas and innovations that will support our work in enhancing innovation capacity for transformation in different fields of sciences.

We hope that this International conference will give opportunities for close collaborations, and strategic alliances in scientific research and projects that will contribute efficiently for a modern and efficient sustainable development in different field of sciences, and for the attenuation of the impact of climate changes.

I expect this conference TIMS -2020 will prove a memorable and productive discourse for all those who are a part of this event. I hope this event will motivate and profit everybody. Finally, I would like to thank DST, New Delhi for their financial support in the organizing of this conference.

**Dr. Richa Kothari**



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## MESSAGE FROM ORGANISING SCRETARY
TIMS-2020, ITM UNIVERSITY GWALIOR

I am happy to enlighten that, School of Sciences, ITM University, Gwalior, is organising an International conference on 8th International Conference on "Technology, Innovation and Management for Sustainable Development (TIMS-2020)," during February 19-20, 2020. It is understood that, this conference provides a leading platform for interaction between scientists, research scholar, consultants, environmentalist and public health professionals engaged in the multi-disciplinary areas of chemistry, agriculture, environment, sustainability, technology and public health. The importance of environment and human health is widely recognized in the world, and there is a growing demand for international experts to work collaborative to address a wide range of issues on a multidisciplinary scientific approach which include the integration of emerging and re-emerging field of sciences, with special focus on environmental sustainability having ecological, economical, technological and social perspective.

The conference will address a holistic approach in decision making on the basis of environmental sustainability with ecological, economical, technological and social perspective options. This conference will facilitate the creation of multidisciplinary interaction in this novel research area. Topics of interest include energy, technologies, modeling, human settlement, materials for sustainability, sustainable agriculture, biotechnology in environment management, food security and nutritional management, sustainable pharmaceutical development, human health, environmental education, green chemistry, ecology, economics and management and youth forum on climate change.

I hope you will enjoy and get enriched with knowledge..

**Lt. (Dr.) Shiv Om Singh**

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# PLENARY LECTURE
## ABSTRACTS

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## PL-01

# BIO-PROSPECTING FOR HEPATO-PROTECTION BY HERBS THROUGH MODULATION OF BIOMARKERS INVOLVED IN LIVER FUNCTIONS

**Anil Kumar**
Director Education,
Rani Lakshmi Bai Central Agricultural University, Jhansi-284 003 (UP) (India)

India is one of the hot-spots of biodiversity but we are still unable to harness it for bioprospecting and development of efficacious herbal medicines. Liver is the major organ responsible for the metabolism of xenobiotics and endogenous substances and is most likely to develop dysfunction due to overexposure to these substances and need preventive and therapeutic measures for normalcy of hepatic function. It is not be surprising that over 10% of the world population suffers from liver disorders. Several medicinal plants have been described as hepatoprotective in the traditional Indian system of medicine because of their already recognized natural way of healing and long lasting curative effects. Such herbal medicine display negligible side effects and hence it is gaining worldwide importance in clinical practices and looked upon as the sources of novel bioactive substances. In order to cure hepatic damage, its early stages should be the centre of attention. However, detailed and systematic investigations on the hepato-protective effects of these medicinal plants have not been carried out to explore the protective mechanisms against commonly occurring hepatic disorders, toxicity as well as potential of hepatocytes regeneration. Development of satisfactory herbal combinations, which are in high demand at national and international level and their therapeutic efficacy, must be investigated using potential biomarker(s) under in vivo and in vitro cell culture system.

The study was undertaken in our lab to determine the hepatoprotective efficacy of Murraya koenigii and Phyllanthus niruri hydroethanolic leaf extracts against paracetamol and alcohol induced damage in both in vivo rat and in vitro HepG2 cell line models. The antioxidant activity was determined by DPPH radical scavenging assay. Tannic acid (TA), a known antioxidant was quantified using HPLC in M. koenigii extracts whereas HPLC quantification of phyllanthin, a lignan known for its hepatoprotective potential was done for all P. niruri extracts. The GC MS analysis of aqueous extracts further detected the presence 40 compounds in M. koenigii and 41 compounds in P. nruri. In vivo studies were carried out in rat as the animal model. Oral administration of alcohol (5mL/kg) for one week followed by paracetamol (1g/kg) for three days produced liver damage in rats as manifested by the significant ($P<0.01$) rise in serum levels of potential biomarkers of liver functions (SGOT, SGPT, ALP, GGT, total bilirubin and direct bilirubin) as compared with respective vehicle control. Biochemical alterations following alcohol and paracetamol administration were ameliorated by post-treatment with herbal leaf extracts of both plants. These studies were further supported by histopathological examination of liver and kidney samples. Analysis of apoptosis and necrosis revealed that necrosis is the major mode of toxicity in PCM and ethanol induced damage. Gene expression analysis of phase I and phase II metabolizing enzymes revealed that preconditioning influenced CYP1A2 (Cytochrome p4501A2) and GGT (Gamma glutamyl transferase) expression but could not influence the GST (Glutathione-S-transferase) expression at later stages. Preconditioning thus influenced the initial steps of PCM metabolism where these initially play a significant role. Post conditioning with extracts showed high expression of CYP1A2 gene whereas it

could not suppress GST expression showing no interference with initial metabolism of PCM. The GGT expression was suppressed in post treatment samples showing their antioxidant nature.

The presentation is focused on bio-prospecting of medicinal herbs and their products which in experimental models have demonstrated hepato-protective activity and thus, most likely candidates to offer therapeutic intervention to liver. Nevertheless, much additional work is still needed to explore molecular pathways to discover potential applications of these medicines so as to open up new vistas in biomedical research.

**Keywords:** biomedical research, antioxidant, Cytochrome p4501A2, Liver, M. koenigii.

## PL -02

## NANOPARTICLES FOR CANCER TREATMENT: ARE THEY EQUALLY SAFER FOR HEALTHY CELLS

**Shivendu Ranjan1,2, and Nandita Das Gupta3**
1Engineering and Built Environment, University of Johannesburg, Johannesburg, South Africa
2Centre for Technological Innovations & Industrial Research South Asian Institute for Advanced Research and Development, Kolkata.
3Institute of Engineering and Technology, Lucknow, Uttar Pradesh

Nano-sized silver and titanium particles are being commercialized in a number of consumer products including food and cosmetics where there is a direct exposure to human body. Studies show that nano-sized silver and titanium particles have shown potential in the anticancerous activities. Studies of our research group have studied and analysed in human colon cancer cell line (HCT 116) and the IC50 was calculated. It was also observed that the nanoparticle induces oxidative stress on HCT116 by increased levels of lipid peroxidation and reduced levels of glutathione. Mitochondrial membrane depolarization was also analysed and Western blot analysis confirms the increased level of Bcl and Caspase-3 which indicates the mitochondrial -mediated apoptosis. Additionally, flow cytometric analysis suggests cell cycle arrest in G2/M phase. Although it has shown potential anticancerous activities but the safety concerns of nanomaterials should not be ignored.

**Keywords:** Nanoparticles, silver and titanium, anticancerous, HCT 116.



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## PL -03

## BIOREMEDIATION AS AN EMERGING TECHNOLOGY TO COMBAT POLLUTION ATTRIBUTED TO TOXIC POLLUTANTS

**Mahendra K Gupta**
School of Studies in Botany, Jiwaji University, Gwalior (M.P.)-474011, India
mkgsac@yahoo.com

The projected increase in world population and the consequent necessity for the intensification of industries has lead to release of toxic pollutants into the environment. The prevalent pollutants generally include hydrocarbons, pesticides and heavy metals. They are frequently used for their applications in agricultural, domestic, industrial and technological aspects, resulting in their circulation in the environment. These toxic pollutants that affect both mankind and ecosystem have become the matter of debate now a days. Most of these pollutants on exposure cause various abnormalities and affect physiological functions of the living beings. Their control and management has become a priority and is quite a difficult task for global authorities concerned with the environment. Different physical and chemical technologies have been adopted to treat these pollutants and make the environment free of contamination. But none has proved to be effective either because of their cost ineffectiveness or release of byproducts that are harmful as well. Further, in order to attain future food security, the management of polluted ecosystems in a sustainable manner is the challenge in itself. Thus, the treatment of such toxic pollutants in a sustainable way has become pivotal in the present scenario. Bioremediation exploiting microorganisms is an emerging technology for combating pollution and has advantages in many aspects over the conventional ones. It is emerging and promising technology because of its safety and cost-effectiveness over the other physicochemical technologies. This technology can be helpful in achieving successful remediation of the contaminated sites by converting highly toxic substances to less-toxic or non-toxic forms. Moreover, genetic engineering of microorganisms offers a novel way to treat these toxic pollutants.

**Keywords:** Pollutants; Bioremediation; Contamination; Genetic engineering

## PL -04

## HEALTH CARE FOR POOR CLASS PEOPLE THROUGH AYURVEDA

**Uttam Kumar Sharma**
Department of Panchakarma, Uttarakhand Ayurveda University, Gurukul Campus, Haridwar

India is one of the fastest growing economies in the world and poverty is on the decline but still a large number of people is living in poverty. These people face so many health problems due to poor hygiene and malnutrition. Most of the time they are not capable to take proper treatment for even general

health problems. Ayurveda is an ancient Indian system of medicine which is predominantly based on herbs, food and life style. Traditionally the vegetables and masala used in kitchen are very useful as medicines. The only need is to educate people how to use them in general ailments. Even water, air and sunlight which is abundantly available for all people are best medicines. The proper uses of these natural resources were well understood by our ancestors and they lived healthy and long with their beneficial application. So many plants and trees are of great value for prevention of diseases and enhancement of health and immunity i.e., Neem, Sahijan, Amaltas, Shirish, Tulsi, Giloy etc. Addiction is also a very big problem among poor people. This can be eradicated by the use of many easily available herbs. There are many concepts of Ayurveda based on daily regimen and food habits, may be very helpful to live healthy with no or negligible expense.

**Keywords:** natural resources, medicines, Neem, kitchen.

## PL -05
## AGROECOSYSTEMS AND CLIMATE CHANGE: USE OF BIOHERBICIDES FOR WEED MANAGEMENT

**J.L. Bhat**
Indian Environmental Society, New Delhi

Impact of climate change on crop production will vary among regions and countries and with different crops. However in general crop yield is expected to increase by 25-30% in C3 plants and 5-10%in C4 plants till 650 ppm concentration of CO2 in atmosphere, however temperature increase will offset benefit of increasing carbon dioxide concentration on crop yield. Crop yield will start declining with increase in average global atmospheric temperature above 1.5-2.0 °C. The effect of increasing carbon dioxide concentration and climate change will be modulated by abiotic edaphic factors such as moisture and nutrient availability and biotic factors such as weeds, diseases, etc. Many abiotic and biotic factors in turn are directly or indirectly modified by climate change. In developing models with reference to changes in climate and carbon dioxide the characterization of abiotic and biotic uncertainties associated with these changes should be incorporated. Improved methods have been developed for studying the affect of atmospheric carbon dioxide concentration on crop yield such as FACE (fumigation method using free air carbon dioxide enrichment) and can be compared with enclosure studies. Climate change may effect weed density, weed distribution (shift in distribution), phenology, growth, reproductive capacity, seed biology, and modulate weed-crop interaction. Integrated weed management (IWM) controls weeds which results in reduction in competition of weeds to crops. Synthetic herbicides are widely used as component of IWM. Use of synthetic herbicides no doubt controls weeds and increases crop production, however it also has adverse impact on environment. In last two decades resistance by weeds to synthetic herbicides is reported all over world, and introduction of new herbicides during this period is limited. The option is to use bioherbicides, which is low cost environment friendly benign technology. This paper has twin objectives to review (1) impact of climate change on weeds and crops, (2) potential of bioherbicides for weed management. Potential bioherbicides are obtained



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from allelochemicals of higher plants and from microbial secondary metabolites. In this study the bioherbicide formulation of mixture from allelochemicals from rice plant and secondary metabolites from Phoma sp. is elucidated. Climate change may result in expansion/contraction or shift in niche of weeds. This study analyses the climatic niche of weed Amaranthusviridis in India by MaxEnt modeling in RCP 4.5 and RCP 8.5 scenarios for the year 2050s .

**Keywords:** Amaranthusviridis, bioherbicide, allelochemicals, IWM

## PL-06
## GLOBAL WARMING AND ITS IMPACT ON INTERNATIONAL SECURITY, ENERGY POLICY AND THE ENVIRONMENT

**Carolyn D. Heising**
Industrial and Manufacturing Systems Engineering Department, Iowa State University, Ames, Iowa USA 50011
**Ram Sharma**
English Department, Janta Vedic College, Bauraut, Baghpat, UP, India

Increasingly, global warming has widespread impact on international security, energy policy and the environment (1). In this paper, we review the status of the implications on international security of global warming resulting from increased tensions between nations as resources, such as water, become more severely restricted (2). It is further predicted that by 2050, two thirds of the world population may face water stressed conditions (3). Energy policy must begin to reduce the burden on the atmosphere of continued emissions of carbon dioxide and other greenhouse gases. The implications for fossil fuel reduction especially that of coal usage, requires a vast expansion of non carbon emitting base load electricity generation technology (4).

There is increasing evidence that global warming is becoming the largest environmental threat of the 21st century (1). According to Dr James Hansen, arguably the leading climate scientist in the United States:

“Planet earth, creation, the world in which civilization developed, the world with climate patterns that we know and stable shorelines, is in imminent peril. The urgency of the situation crystallized only in the past few years. We now have clear evidence of the crisis, provided by increasingly detailed information about how Earth responded to perturbing forces during its history. The startling conclusion is that continued exploitation of all fossil fuels on Earth threatens not only the other millions of species on the planet but also the survival of humanity itself and the timetable is shorter than we thought.” (1)

Increasingly, global warming has widespread impact on international security, energy policy and the environment (1). In this paper, we review the status of the implications on international security of global warming resulting from increased tensions between nations as resources, such as water,

become more severely restricted(2).

“Waves of climate refugees. Dozens of failed states. All-out war. From one of the world’s great geopolitical analysts comes a terrifying glimpse of the strategic realities of the near future, when climate

Change drives the world’s powers towards the cut-throat politics of survival” (2)
It is further predicted that by 2050, two thirds of the world population may face water stressed conditions (3).

“Thus, climate change impacts are going to be most severe in the developing world, because of their poor capacity to adapt to climate variability. India also comes under this category. The NATCOM study was the first attempt to quantify the impact of the climate change on the water resources of the country. The initial analysis has revealed that under the green house gas (GHG) scenario, severity of droughts and intensity of floods in various parts of the country may get deteriorated” (3)

Energy policy must begin to reduce the burden on the atmosphere of continued emissions of carbon dioxide and other greenhouse gases. The implications for fossil fuel reduction, especially that of coal usage, requires a vast expansion of non carbon emitting base load electricity generation technology (4).

“Stablizing the carbon dioxide-induced component of climate change is an energy problem. Establishment of a course toward such stabilization will require the development within the coming decades of primary energy sources that do not emit carbon dioxide to the atmosphere.

**Keywords:** global warming, fossil fuel, environment, energy policy

## PL-07
## CARBON SEQUESTRATION: A REGULATORY ECOSYSTEM SERVICES FOR SUSTAINABLE DEVELOPMENT

**Avinash Tiwari**
School of Studies in Botany, Jiwaji University, Gwalior, M.P.

Regulatory Ecosystem Services (RESs) refer to attributes and processes where natural and managed ecosystems helps in sustaining ecosystem functions and create an environment to thrive and flourish planetary life. Today, sustainability is a key challenge for humanity in the 21st century. The regulating ecosystem services such as carbon sequestration are generated through a close interaction of the pedosphere with all the components of environment. Provision of these services and functions also depends on the land use (e.g. pastoral, arable, silvicultural, urban, recreational and spiritual). Because of strong interactivity, land misuse and soil mismanagement can degrade soil quality, accelerated



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erosion or either reduces quantity and quality of ecosystem services (e.g. biodiversity etc.) or leads to disservices. The abrupt climate change as an example of human footprint caused by the use of natural resources, also impacts ESs and the underlying processes. Thus, land use and soil management to enhance the biospheric carbon sinks for carbon sequestration requires a comprehensive understanding on the effects of ecosystem services.

Developing mechanisms and identifying/implementing policies for payments to land managers for enhancing RESs such as carbon sequestration can promote adoption of best management practices and facilitate restoration of degraded soils and ecosystems. Recarbonizations of the biosphere and soil sequestration are important strategies to enhancing and sustaining ecosystem services and functions of natural and managed ecosystems. Payments for ecosystem services including carbon pricing must address the relationship between carbon sequestration and ecosystem services to minimize risks of overshoot, and promote sustainable use of land-based carbon sinks for human wellbeing. Thus the better protection of natural assets will require coordinated efforts across all sections of governments, businesses, and international institutions.

RES science holds great promise to help society assess progress toward meeting planetary sustainability and development goals such as the Sustainable Development Goals. To fully achieve that potential the RESs must continue to develop beyond disciplinary boundaries to consider the long-term provision of RESs by social-ecological systems.

**Keywords:** Regulatory Ecosystem Services, carbon sequestration, social-ecological systems, recarbonizations.

## PL-08
## SOLAR ENERGY: ADVANCES AND OPPORTUNITIES FOR SUSTAINABLE DEVELOPMENT

**Chandra Shekhar Malvi**
Mechanical Engineering Department, Madhav Institute of Technology& Science, Gwalior
csmalvi@mitsgwalior.in,

Chief Seattle once said“we do not inherit the earth from our parents; we borrow it from our children’. Therefore it is our duty to keep this deposit safe, clean and sustainable. However, we require energy to maintain present and future.Oil plays a great role in conventional energy but country’s present demand says that ‘It’s time we end foreign oil dependence’. Finally, in this scenario the only option left is renewable energy in which most prominent is solar energy.

Solar energy is so customised energy that wherever you want in a particular amount, it is there. Power can be in hand or can be grid connected. UN energy assessment found annual potential of solar energy was about 50000 exajoules (EJ) whereas world energy consumption was about 560 EJ in 2012. Also, the

International Energy AgAgencsaid that “the development of affordable, inexhaustible and clean solar energy technologies will have huge longer-term benefits. It will increase countries’ energy security through reliance on an indigenous, inexhaustible and mostly import-independent resource, enhance sustainability, reduce pollution, lower the costs of mitigating global warming, and keep fossil fuel prices lower than otherwise. These advantages are global. Hence the additional costs of the incentives for early deployment should be considered learning investments; they must be wisely spent and need to be widely shared”.

Several innovative projects are designed, developed and demonstrated. Innovations had potential from solar cell to solar plant size. Advance solar technology includes; Solar Photovoltaic-Thermal Technology, float-voltaic panels, effect of dust, Solar panel cleaning approaches, wind Driven Mechanism, building integrated photovoltaic, new solar cell materials. Also, several economical model for solar installation have potential to opt.

**Keywords :** innovation, solar energy, solar cell, design, opportunities.

## PL-09
## CYANOBACTERIAL TOXINS AND THEIR IMPACTS ON HUMAN HEALTH

**Rishi Kumar Saxena**
Department of Microbiology, Bundelkhand University, Jhansi 284 128

Cyanobacteria or blue green algae are prokaryote photosynthetic organisms and feature among the pioneering organisms of planet Earth. They have been in existence for at least 2.7 billion years, and are considered to be the main primary producers of organic matter and the first organisms to have released oxygen into the primitive atmosphere. Cyanobacteria are a group of phytoplankton of marine and fresh water. The accreted eutrophication of water sources by agriculture and industrial runoff has increased the occurrence and intensity of cyanobacterial blooms. They are of particular concern because of their production for potent hepato- neuro and dermitoxins, being hazardous to human health.  Toxic blooms can reappear periodically in hydric environments, and people may be chronically exposed to cyanotoxins at relatively low doses. Known toxins such as microcystins, nodularins, and cylindrospermopsins can cause liver and kidney damage, cytotoxicity, neurotoxicity, skin toxicity, gastrointestinal disturbances, and other problems. These effects may take place within a few minutes of exposure or may appear days later. The information on cyanobacteria and their toxins in terms of their occurrence, chemical and toxicological characteristics, fate in the environment, guideline limits, and effective treatment techniques to remove these toxins from drinking water.

**Keywords:** cyanobacteria, primary producers, microcystins, nodularins, toxicity.



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## PL-10
## ECOLOGICAL MODELLING AS A TOOL FOR WATER QUALITY MANAGEMENT

**R. Bhutiani**
Limnology and Ecological Modelling Lab
Department of Zoology and Environmental Sciences GurukulKangriVishwavidyalaya, Haridwar (Uttarakhand) INDIA
rbhutiani@gmail.com

A mathematical model is representation of physical stream. It acts as a bridge between study of mathematics and application of mathematics in biological and other fields. Modeling is an abstraction of reality and its ultimate objective is to explore the complexity of functions and structure of the system under study. Today a wide variety of models belonging to different nature and category are available to understand the processes of the environment around us Interactions between mathematical and biological sciences have been increasing rapidly in recent years. The use of system analysis and mathematical model for formulation and solving the environmental pollution is of relatively recent vintage and has been used widely since last three decades. These models can be used to conduct numerical experiments, test hypothesis and help to understand the response of environmental pollution. A modeling approach can result in considerable saving in both time and money side by side it can reproduce further probabilities to be experimentally verified in future. A model is an abstraction of reality. This abstraction represents a complex reality in the simplest way that is adequate for the purpose of the modeling. Much of our progress in the last few centuries has made it necessary to apply mathematical methods to real-life problems arising from different fields-be in Science, Finance, management etc. Modeling is not an alternative to observation but, under certain circumstances can be powerful tool in understanding observations and in developing and testing theory. The process of translation of a real life problem into a mathematical form can give a better representation and solution of certain problems. Here in this paper we will discuss the steps involved in the process of modeling.

**Keywords:** environmental pollution, mathematical model, biological sciences, water quality.

## PL-11
## METAL BASED SYNERGISTIC ANTICANDIDAL POTENTIAL OF GREEN TEA CATECHINS AND ANTIMYCOTICS

**Jigisha Anand1, Nishant Rai2***
1Department of Biotechnology, Graphic Era (Deemed to be University)India
2Department of Biotechnology, Graphic Era (Deemed to be University)Dehradun, Uttarakhand
*Corresponding author: nishantrai1@gmail.com

The incidence and prevalence of life threatening Candida infections has increased worldwide and are the significant cause of morbidity and mortality in immune-compromised patients and associated with

nosocomial infection. Green tea is rich in flavonoids, majorly the catechins and known for its high antioxidant potential. The significant catechins in green tea serve as valuable starting material for the medicine development against microbial infection. The present investigation evaluated synergistic herbal composition of purified catechins with known antifungal drugs against Candida albicans MTCC 3017 and Candida glabrata MTCC 3019. Also, in silico study identified novel inhibitors of ergosterol biosynthesizing target proteins in Candida species which confer green tea as a potent candidate for anticandidal drug therapy.

The purified catechins were isolated from green tea (GT) leaves collected from three different geographical locations in North India (Assam, Himachal Pradesh and Uttarakhand). Synergistic activity of GT catechins with fluconazole and amphotericin B was assessed through Chequerboard assay and Time kill assay. Further, Copper sulphate was incorporated into the synergistic composition of catechins and antimycotics and its effect on percentage inhibition was evaluated. Scanning electron microscopy was done to observe anticandidal effect of the synergistic composition while cytotoxicity analysis of the composition was performed by MTT assay on Vero cell lines.

Purified catechins of Assam and Himachal Pradesh green tea showed synergistic activity with Fluconazole and Amphotericin B against C. albicans. However, purified catechins isolated from green tea (Uttarakhand) and their combination with amphotericin B depicted synergistic inhibition of C. glabrata. The synergistic effect of antimycotics and GT catechins was observed at the varying concentrations of Fluconazole, Amphotericin B and GT catechins. Time kill assay depicted synergistic activity of Assam GT in MIC and 2MIC of the purified catechins and antimycotics against C. albicans and C. glabrata after 24 h of incubation. Incorporating varying concentrations of copper sulphate to the synergistic combinations showed an increase of 0.4% to 4.85% in inhibitory potential against C. albicans, while increase of 2.74% to 6.63%in inhibitory potential was depicted against C. glabrata.

SEM analysis revealed morphological distortions of treated Candida cells. The synergistic composition was non-cytotoxic with percentage viability of treated cells evaluated between ≥ 91.4 to ≥ 99.8%. However, percentage viability of Vero cells was increased up to ≥ 97.4% to ≥ 100% in presence of $CuSO_4$.

From the present study, it can be concluded that green tea has a potential anticandidal activity and can be considered as active herbal component of combinational drug therapy. The stability, selectivity and bioavailability of green tea and its interaction with antibiotics and metal ions are needed to be ascertained. Toxicological studies, optional ratio and dose regimes need to be explored to acquire higher efficacy of the combination.

**Keywords:** Green tea catechins, Synergistic, Candida, Amphotericin B, Ergosterol



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## PL-12
## WATER QUALITY INDEX OF GANGA RIVER WATER, HARIDWAR, UTTARAKHAND

**D. R. Khanna, Rakesh Bhutiani, Faheem Ahamad and Khushi Ram**
Limnology and Ecological Modeling Lab., Department of Zoology and Environmental Science,
Gurukula Kangri Vishwavidyalaya, Haridwar
rbhutiani@gmail.com

The present purpose deals with the monthly variations in the Physico-chemical parameters of river Ganga in the Haridwar region. Various physicochemical parameters analysed during the study period included temperature, pH, dissolved oxygen (DO), biochemical oxygen demand (BOD), chemical oxygen demand (COD), alkalinity, acidity, total hardness (TH), calcium, magnesium, total dissolved solids (TDS), total solids (TS), free CO2 and chlorides. The study helped to assess the changes in the water quality along with the different study sites. Water Quality Index (WQI) is a very useful technique for assessing the suitability of water quality. Water quality indexing including Arithmetic weighted index WQI by National Sanitation Foundation (NSF-WQI) are also applicable to the Physico-chemical parameters to evaluate the water quality along the Haridwar region.

**Keywords:** Water Quality Index, Haridwar, NSF-WQI, Ganga, COD, DO.

## PL-13
## FRACTIONAL COMPOSITION OF RAW COTTON MINERAL PARTICLES

**Arabboyeva Zamira Mamurovna1, Hurmamatov Abdugoffor Mirzabdullayevich2 and Kholmuradova Nishona Karamatovna3**

1Processes and Devices of Chemical Technology Laboratory
IGIC Ruz, E-mail: Zamiragew82@jmail.com
2 Laboratory of “PaDChT” IGIC Ruz, the Dr.Sci.Tech.
E-mail: gafuri_19805@mail.ru
3 Institute of Microbiology, Uzbekistan Academy of Sciences, Tashkent
E-mail:nishona1989@mail.ru

Dust is characterized by a combination of properties that determine its behavior in the air, its transformation in the body and its effect on the body. Of the various properties of industrial dust, chemical composition, solubility, electric charge, and radioactivity are of the greatest importance. Depending on the composition, dust can have a fibrogenic, irritating, toxic, allergenic effect on the body. Of paramount importance for the development of dusty lung diseases is the mineralogical composition of dust, especially the content of silicon dioxide in the dust. In this article, the author considers the fractional composition of raw cotton dust particles. Experimental studies, on the fractional composition of dust particles of raw cotton were carried out, within the duration of the process, on a vibrating sieve of 10 to 500 microns.

**Keywords:** fraction, raw cotton, vibration, sieve, mineral dust

## PL-14

## SUSTAINABLE MANAGEMENT OF ECONOMICALLY IMPORTANT NTFPS OF CENTRAL INDIA FOR THEIR CONSERVATION AND SUSTAINING LIVELIHOOD OF DEPENDENT COMMUNITIES

**Hari Om Saxena1and A.K. Pandey2**
1NTFP Discipline, Silviculture, Forest Management and Agroforestry Division,
Tropical Forest Research Institute, Jabalpur (M.P.) - 482021
2Forest Research Institute, Dehradun (Uttarakhand) - 248006
hariomsaxena81@gmail.com

Non timber forest produce (NTFPs) are an important source of livelihood for large sections of rural communities; particularly those living in forest fringe villages. NTFPs play a vital role in tribal household income, especially in the remote and isolated pockets near and around the fringe of open forests, sanctuaries and reserve forest areas. These pockets of human populations (tribal and rural communities) are greatly dependent on forest based livelihoods for their daily requirements. Over 90% collection of NTFPs including medicinal plants traded in India are harvested from the wild, generating about four million of mandays employment (both part and full time) and since 70% of plants collection involves destructive harvesting, many plants have come under RET (rare, endangered and threatened) categories. Generally the collectors are harvesting NTFPs without considering the sustainability issues. Although unnecessary, the collectors are gathering NTFPs by pollarding and felling the trees/shrubs, cutting of lateral branches, digging of main roots, girdling of stem bark, 100% uprooting of herbs from the forests etc following unscientific harvesting practices. These unscientific and unsustainable practices resulted in depletion of many economically important species from forests and are adversely affecting the livelihood of millions of people dependent on collection and processing of NTFPs. Sustainable management of NTFPsisvery necessary for the long term survival of wild populations and their habitats. WHO guidelines can be followed while collecting medicinal plant materials. TropicalForest Research Institute, Jabalpur has standardized the scientific and sustainable harvesting practices for various economically importantNTFP species viz. Terminalia arjuna (Arjuna),Litsea glutinosa (Maida chhal), Saraca asoca(Sita ashoka), Oroxylum indicum (Shyonak),Holarrhena antidysenterica(Kutaj), Andrographis paniculata (Kalmegh), Tinospora cordifolia (Giloy), Gymnema sylvestre(Gudmar), Asparagus racemosus (Satavar), Embelia tsjeriam-cottam(Viavidung), Celastrus paniculatus (Malkangni), Phyllanthus embelica (Aonla), Buchanania lanzan (Achar), Terminalia chebula (Harra), Cyperus scariosus (Nagarmotha), Bauhinia vahlii(Mahul Patta), Madhuca latifolia (Mahua) whichwill lead in conservation of these precious species in the forests as well as ensure the livelihood of millions of people depending on forests.

**Keywords:** NTFPs, Forests, Sustainable Harvesting, Tribal & Rural Communities, Livelihood



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## PL-15

## IMPACT AND ASSESSMENT OF PGPR AND EARTHWORM INTERACTION IN MANAGEMENT OF ROOT KNOT NEMATODE, MELOIDOGYNE INCOGNITA INFECTING TOMATO, LYCOPERSICON ESCULENTUM MILL

**Rajendra Singh**
Plant Nematology Research Lab, Department of Zoology
Bareilly College Campus, MJP Rohilkhand University, Bareilly-243006, UP, INDIA
singh.rajendra007@gmail.com

To screen and evaluate the biocontrol potential of PGPR strains and Earthworm against root knot nematode, Meloidogyne incognita. Micro-pot experiments were conducted to investigate the effects of a new Indian earthworm species “Jai Gopal” (Perionyx ceylanesis) and PGPR strains in management of Meloidogyne incognita in glass house of Bareilly College campus at 28° 20’ 49N 79° 25’ 19E 252 meters of altitude in India. Readily available culture of three species of PGPR, including Azotobacter chroococcum HKN-5, Bacillus megaterium HKP-1, and B. mucilaginous HKK-1, in Luria-Bertani (LB) broth was inoculated in 15 days old plantlets of susceptible cultivar of tomato (Lycopersicon esculentum Mill.) infected with 200 juveniles (J2) of Meloidogyne incognita/pot. Soil of each pot was pre-inoculated with three pairs of young (20 days old) Jai Gopal earthworm. Five sets of experiments with three replicates viz; Normal Control Un-inoculated (NCU), Normal Control with earthworms only (NCE), Normal Control with PGPR only (NCP), Infected Control with Meloidogyne only (ICM) and Treated pots with PGPR, earthworm and Meloidogyne (TPEM) were cultured in glass house conditions for next 30 days. All the replicates were harvested to analyze the plant growth parameters like length and weight of shoot and root, chlorophyll content and root knot index (RKI). It has been observed that there were synergistic effects of dual inoculation of earthworms and PGPR in increasing the plant growth parameters and chlorophyll content and this treatment inhibits the nematode population which is shown by reduced root knot index over the infected control replicates. On preliminary level this can be concluded that PGPR strains and earthworm castings enhance the bioavailability of essential nutrients for plant growth and possibly these conditions creates an unfavourable conditions for penetration and multiplication of parasitic nematode, Meloidogyne incognita. The study highlights biocontrol potential of PGPR and earthworms in management of root knot nematodes. PGPR offers an environmentally sustainable approach to increase the yield of crop production and soil health. Extension of this work is in progress to study the interaction of PGPR, earthworm, pathogen and host plant at molecular and genetic level.

**Keywords:** Plant Growth Promoting Bacteria, Perionyx ceylanesis, Lycopersicon esculentum, Meloidogyne incognita, Azotobacter, Bacillus.

## PL-16
## IN VITRO STUDY OF EFFICACY OF MANCOZEB AGAINST TRICHOTHECIUM ROSEUM ON EGGPLANT (SOLANUM MELONGENA L.)

**Adarsh Pandey**
Department of Botany, S. S. (P.G.) College, Shahjahanpur-242001 UP

Trichothecium roseum was found to be present on Brinjal fruit causing Pink rot. This fungus was found in a particular period of the year i.e., in the months of March and August in Bareilly region. The biannual attendance of Trichothecium roseum has increased the curiosity to know much information regarding its tendency to encounter of eggplant. Therefore this mysterious fungus was selected for the present study. Unique geographical situation and agro climatic conditions of Bareilly region make the pathological study of the eggplant more relevant and significant. Trichothecium causes pink rot is a parasite of fleshy fungi. Alternating two-celled, clavate conidia held at their bases are typical characteristics of Trichothecium roseum. Mancozeb was taken into an account to control the test fungus. Mancozeb is grayish yellow powder, insoluble in most organic solvents. It is used to protect many fruits, vegetables, and field crops against a wide spectrum of fungal diseases. The addition of zinc chloride to a suspension of maneb yields mancozeb, superior to maneb. Four concentrations viz., 0.5%, 1%, 1.5% and 2% were used to manage the test fungus with a control plate with no chemical. In the present investigation,in vitro study was carried out to evaluate the efficacy of Mancozeb against Trichothecium. Mancozeb at 2% concentration proved its superiority over any other treatment. The radial growth of Trichothecium roseum was significantly reduced in all the treatments compared to the control, however its efficacy at all concentrations during the investigation was found significantly effective.

**Keywords:** Pink Rot, chemical control, Solanum melongena, Vegetables Diseases, Fruit Diseases.

## PL-17
## RAMGANGA RIVER POLLUTION STATUS IN BAREILLY REGION

**Ramesh Chandra**
Department of Zoology, S.S. (P.G.) College, Shahjahanpur,U.P.India
rameshraj379@gmail.com

River Ramganga is a major source of water to the rural population of western Uttar Pradesh, India. The main goal of the present study was to assess the impact of urban and industrial activities on the water quality of river Ramganga at the Bareilly. For this, river water samples were collected from five different sites all along the route of Ramganga main streamline and were analyzed for chemical oxygen (COD) demand and biochemical oxygen demand (BOD) levels. There were variations for BOD (2.75–6.84 mg l – 1) and COD (23.90-43.60 mg l – 1) levels at different sites. The BOD values noticed were almost



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within the permissible limits of USPH and WHO (5mg/L and 6mg/L) at most of the sampling sites. The COD values in the present study remained higher than the COD values published for most of other Indian rivers by CPCB (1991). The values generally exceeded the tolerance limit of -5mg/L, prescribed by USPH and WHO. This is the study on itself and the interrelationship of human activities and river water quality makes the study significant and interesting to assess the pollution load discharges in catchments of Ramganga at Bareilly. Overall, the water quality of Ramganga was relative poor with respect to its use for domestic purposes.

**Keywords:** River Ramganga, water quality, BOD and COD.

## PL-18
## ASSESSMENT OF TOXICITY OF BLEND OF ARTIFICIAL FOOD COLORS IN SWISS ALBINO RATS, RATTUS NORVEGICUS

**Beenam Saxena**
Department of Zoology, Bareilly College, Bareilly, Uttar Pradesh, India
beenam_1972@yahoo.co.in

An adulterant is a chemical substance which should not be carried with other substances like food, beverages, vegetables, pulses etc. for legal and other reasons. These are intentionally added and made invisible by camouflaging with the colors or textures.

Artificial food colors are used in the food industry during preparation, production, packaging and storage stages. Coloring of food has been done to adjust its color to desired level because various stages of processing, storage and sale may result discoloring of food. So colorants are commonly used food additives and deliberately added to food substances to impart those desired characteristics. The aesthetic appeal of food is important factor for selection of products by consumers that is why synthetic food color requires certification by Food and Drug Administration (FDA). Admissible daily intake limits are recommended for food colors. However the amount of color consumed overtime may vary according to individual's preferences, so it is essential to regulate and control the amount consumed cumulatively. So there is requirement of testing toxicity due to chronic exposure to these food colors. Thus present study aims to explore toxic effects which may be caused by these coloring agents.

Swiss albino rats were divided into four groups, each group having six animals. Group I served as control, Group II, Group III and Group IV were administered with 25, 50 and 75 mg/kg body weight blend of sunset yellow, metanil yellow and tartrazine for 30 days. Hepatotoxicity in rats, treated with a blend of these food colors was studied by assessing parameters such as serum total protein, serum albumin, serum alkaline phosphatase (ALP) as well as hepatic malondialdehyde (MDA). The activity of superoxide dismutase (SOD), reduced glutathione (GSH) and catalase (CAT) were assessed.

Significantly increased concentrations of serum total protein, serum albumin, serum ALP and hepatic MDA and significantly lowered levels of SOD, reduced GSH and CAT in the liver tissue of treated animals were observed when compared with control animals. The alteration in the liver includes necrosis of hepatocytes, infiltration and vacuolation.

The result indicates that consumption of food color in diet induces liver tissue damage. The used doses of food color were mostly attributable to hepatocellular damage and drastic alteration in antioxidant defense system.

**Keywords:** Metanil yellow, sunset yellow, Swiss albino rat, tartrazine

## PL-19
## EDUCATION & RESEARCH FOR SUSTAINABLE DEVELOPMENT

**Vikas B Thakare**
Scientist
Defence R&D Establishment,Gwalior-474002
Email-vikash@drde.drdo.in

Sustainable Development is best understood as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland 1987). Technology, Innovation & Management are the means to attain the Sustainability goals within limited resources and fastest time frame. Education & Research are the essential tools to foster Technology, Innovation & Management and in turn Sustainability. Education is one of the Sustainable Development Goals (SDG) set by UN which can act as a catalyst and make the other SDG’s to happen in stipulated time & limited resources. In India we are orienting fast towards these SDGs through our R&D initiatives at Government funded research Institutions, Universities, Corporate etc. Many Corporate companies & Start-up’s now have Innovation as their driver. Number of research workers are working on green technologies, climate change, health, drinking water, sanitation, education etc to support these Global requirements.

**Keywords:** Education, Innovation, Research, Sustainable Development Goals (SDG), Sustainability

# ORAL PRESENTATION
## ABSTRACTS

## OP-01

## PHENOLOGY AND GERMINATION BEHAVIOR OF THREATENED AND ENDEMIC PLANT SPECIES OF KASHMIR HIMALAYA

**Aabid Hussain Mir*, Azra N Kamili**
Centre of Research for Development, University of Kashmir, Srinagar, India-190006
*Corresponding author Email: aabidm4@gmail.com

The current study highlights the phenology and germination behavior of the threatened and endemic plant species of Kashmir Himalaya. The species started their lifecycle with the onset of spring season, flowered in summer, fruited in autumn and senesce in winter season. The fruit types produced include capsule, pod, berry, drupe and achenes. The species showed zoochoric, anemochoric and autochoric modes of dispersal.The germination phenology revealed that most of the species undergo a period of dormancy during winter season and germination collides with the onset of rain indicating that increase in raise in temperature and snow melt aids in germination.Under natural conditions, the number of days required for germination ranged from 100-250 where cold stratification played a pivotal role.Since last few decades, the populations of these species have been shrinking in their natural habitats due to over exploitation for medicinal purposes, habitat destruction and amplified humanoid interferences like expansion of agricultural land, road building, grazing and urbanization. Thus there is an urgent need to come up with positive strategies to save whatever is left and plan long term rescue measures not only to protect these species from extinction but also to reintroduce them to natural habitats.

**Keywords:** Alpine ecosystem, Cold stratification, Dormancy, Endangered

## OP-02

## ANALYSIS AND EVALUATION OF THE ANTICANCER COMPOUNDS FROM THE RHEUM SPECIES

**Shagoon Tabin1, Azra. N. Kamili1, R. C. Gupta2**
1Centre of Research for Development University of Kashmir Srinagar,
2Department of Botany, Punjabi University, Patiala)
Corresponding author: shagoonkhan@gmail.com

Rheum species is a perennial stout herb, distributed in the temperate and sub tropical regions of Himalaya from Kashmir to Sikkim at elevation of 2800m to 3800m. The genus Rheum have been domesticated as medicinal plants for human consumption as its roots and stem are rich in anthraquinones such as Emodin and Rhein. Recent research has shown that Rheum is an anti-cancer medicinal plant. Emodin a component in Chinese Rheum root, has been found to inhibit the growth of cancer cells. This work presents the qualitative and the quantitative analysis of three anthraquinone derivatives (emodin, aloe-emodin, and rhein) in rhizomes and roots of different





Rheum species from various altitudes and invitro plants of the same plant. HPLC analysis revealed the presence of three anthraquinone derivatives in rhizomes and roots of ex-situ plants and invitro plants. The results showed a variation in the content of the compounds from the different areas. The content of the compounds was found to be more in the ex-situ plants than the invitro plants. The callus, roots and leaves of invitro plants were further evaluated for the analysis of the compounds. The aloe-emod in and emod in was presents in the callus and leaves while the rhein was present only in the callus of only one species.

**Keywords:** Anthraquinone; Plant tissue culture; Rheum; Emodin; Aloe-emodin; Rhein.

## OP-03

## ASSESSMENT OF HOUSEHOLD AIR QUALITY STATUS AND ITS IMPACT ON WOMEN'S HEALTH IN RURAL AREAS OF MADHYA PRADESH

**Prachi Dixit1*, Kajal S. Rathore and Shivom Singh1**
1Department of Environmental Science, School of Sciences, ITM University, Gwalior, Madhya Pradesh, India
Department of Biotechnology, Govt. Kamla Raja Girls Post Graduate College, Gwalior, Madhya Pradesh, India
*JRF-MPCST Project
Shivomsingh@itmuniversity.ac.in

In rural areas of India, the most important indoor air pollutants are combustion products of solid biomass fuels used by the rural population for cooking. Rural population relies on biomass in the form of wood, dung cake and crop residues for domestic energy. These materials are typically burnt in traditional cooking stove or chulha. Aim of the study was quantification of indoor air pollutants concentration by monitoring parameters (SO2, NO2 and SPM) were generated from different types of biomass burning for cooking in rural households. Development of specific questionnaire for collecting information through door to door participatory survey. Indoor air sampling was done seasonally in the selected households in four selected villages of four districts of Madhya Pradesh by using handy air sampler and gaseous air pollutants sampler followed by standard determination methods. The degree of gaseous pollution level in winter season, concentration were recorded somewhat higher level during monitoring. Average concentration of SO2, NO2 and SPM were observed 74.05 µg/m3, 78.06 µg/m3 and 1125 µg/m3 respectively in winter season and 70.17 µg/m3, 76.76 µg/m3 and 1082 µg/m3 respectively in summer season. Results indicated that biomass fuel represents a main energy source for cooking, the wide range of energy sources listed by households for cooking and heating indicates that the probability of household air pollution level in these dwellings likely to be high. It can be concluded based on survey study that there is significant health risk such as bronchitis, lung cancer, dizziness etc. are associated with increased concentration of gaseous pollutants and suspended particulates.

**Keywords:** Indoor air quality, gaseous pollutants, health risk, chulha, biofules.

## OP-04

## CLADOCERA COMMUNITY STRUCTURE AND ITS RESPONSE TO ENVIRONMENTAL FACTORS IN TELBAL NALLAH

**Irfan Jamila**
Department of Zoology, GWC, M.A. Roa ,Sgr.
irfanjamila@yahoo.com

The study was conducted to assess the Community structure of Cladocera and their relation to the environmental impact of Telbal –nallah .Telbal nallah is located towards the North –West of the Dal Lake . It is under tremendous anthropogenic pressure leading to rapid trophic evolution in the form of eutrophication .While studying the Zooplankton community of Telbal nallah during 2014 -2015, 11 taxa of Cladocera represented by 3 families viz, Chydoridae, Bosminidae and Daphnidae were recorded . Family Chydoridae was dominant group followed by Bosminidae and Daphnidae. Alona monocanthus formed the main contributor to the total Chydoridae with highest population density and Camptocercus retrirostris recorded least density. Ceriodaphnia reticulata and Bosmina coregoni were dominant among the family Daphnidae and Bosminidae respectively and formed blooms at times .Least population density were recorded by Moina micrura and Bosmina longirostris from Daphnidae and Bosminidae family . They varied in population density on account of variations in the physico chemical characteristics of the Lake. Dominance pattern of various taxa are attributable to the ecological set up of the water body which has been continuously receiving domestic sewage from catchment area and are indicators of trophic status of the water body

**Keywords:** Trophic evolution, Dominant, Anthropogenic, Domestic sewage

## OP- 05

SEASONAL VARIATIONS IN THE PROPERTIES OF PHYTOCONSTITUENTS OF SOME

## MEDICINALLY IMPORTANT PLANTS

**Shirin A. Qureshi* and Hitesh A. Solanki****
Department of Botany, Gujarat University, Ahmedabad, Gujarat, India.
qureshi.shirin@yahoo.co.in, husolanki@yahoo.com

Medicinal Plants play an important role in the development of potent therapeutic agents. About 80% of people in developing countries rely on traditional medicine based largely on various species of plants for their primary health care. Herbal medicines are currently in demand and their popularity is increasing day by day. These plants have been of immense importance since their mention in our ancient Indian Literature i.e. Ayurveda texts like Charaka Samhita. The seasonal variations in the phytochemicals of 5 medicinally important plants i.e. Achyranthes aspera L.leaves, Boerhaavia diffusa L.roots, Centella asiatica (L.) Urb. leaves, Moringa oleifera L.leaves, Tinospora cordifolia (Willd.) Miers. stem was studied qualitatively and quantitatively using Phytochemical Screening techniques, FT-IR studies and Chromatography techniques. Also, the DPPH Free Radical Scavenging activity for Antioxidants of the 5 plants in all the seasons was studied. The results showed good antioxidant activity for Achyranthes aspera L. leaves in summer and the phenolic content was highest during winter. For Boerhaavia diffusa L. roots, the antioxidant activity was highest in winter season and the alkaloids content was found to be more in summer followed by winter. For Centella asiatica (L.) Urb. leaves, the antioxidant activity was highest in winters and the total terpenoids content in Centella asiatica (L.) Urb. leaves was highest in winter. For Moringa oleifera L. leaves, the antioxidant activity was highest in winter and the nitrile glycosides content was almost in equal amounts in winters and monsoon. For Tinospora cordifolia (Willd.) Miers. stem, the antioxidant activity was highest in winter season and the total alkaloids content in Tinospora stem was higher in rainy season followed by summer and winter. Depending upon the phytochemicals of interest one must follow these parameters and seasons to essentially maintain the best quality of their products. These selected medicinal plants having versatile properties are good candidates for new drug discovery, development and herbal formulations.

**Keywords:** Medicinal Plants, Ayurveda, Phytochemicals, Herbal, Antioxidants.

## OP-06

## RECENT ADVANCES AND CURRENT PERSPECTIVES IN DEMENTIA

**Ekta Khare1, Zeeshan Fatima2**
1I.T.M. University, School of Pharmacy, Gwalior (M.P.), India
2Amity Institute of Pharmacy, Amity University, Lucknow (U.P.), India
ekta.sop@itmuniversity.ac.in

Dementia is causally associated with disruption of cerebral neuronal circuits, with the amount and location of neuronal loss resulting in its characteristic symptomatology. The neurotransmitter acetylcholine (Ach) appears to be particularly important for memory, and loss of cholinergic neurons may underlie memory loss in AD. Cognitive enhancers are medications and natural supplements that are used to improve the functions of various human cognitive abilities when they have become impaired in some manner. Cognitive enhancers includes drugs interacting with receptors (e.g. NMDA receptor antagonist: galantamine), Enzymes (e.g. AchE inhibitors: tacrine, donepezil), Antioxidants (e.g. resveratrol, curcumin and acetyl-L-carnitine), Metal chelators (e.g. calcium and zinc chelator : DP-b99), Vaccines, Monoclonal antibodies (e.g. A beta Amyloid: solanezumab under Phase III clinical trial). Apart from the pharmacological approaches, dietary supplementation and encouragement of healthy lifestyle which is physically and mentally stimulating are going to have a big impact on cognitive research in future.

**Keywords:** Acetylcholine,AchE inhibitors, Amyloid β protein, tau (τ) protein, Antioxidant

## OP-07

## LIMNOLOGICAL STUDY OF RIVER KOSIIN NAINITAL AND UDHAM SINGH NAGAR (UTTARAKHAND)

**Ravi kumar, Pramod joshi and K. C. Joshi***
Department of Zoology, Radhey Hari Govt. P.G College, Kashipur, U.S. Nagar–244713 (Uttarakhand), India.
*Deptt. Of Chemistry R H Govt. P G College Kashipur.U S, Nagar Uttarakhand.
ravigola76@gmail.com

India, the growing Asian economy has an important place on the world map. India has numerous river systems. Rivers and lakes are the natural heritage of a country. Rivers are the most abundant, vital and open fresh water system. The whole world is blessed with numerous river systems and river tributaries. River Kosiisone of the major Tributaries of river Ramganga and is one of the important rivers of northern part of Uttar Pradesh and Uttrakhand. The major areas, which are parts of Kosi river basin, are Totaam, Garajiya Ramnagar (Distt. Nainital), Kashipur (Distt. Udham singhNagar), Dadiyal, Swar, Lalpur, and Rampur (UttarPradesh). Limnology is Greek word, limnee “lake” and, also called fresh water science, is the study of in land waters. It is often regarded as a division of ecology or environmental science. It covers the biological, chemical, physical, geological, and other attributes of all in land waters. This includes the study of lakes and ponds, rivers, springs, streams and wetlands. River water pollution is not only an aesthetic problem, but a serious economic and Public health problem as well. Kosi River is polluted but still can be used for agriculture and fish culture. But there is an urgent need to control the further deterioration of river water quality. It also underlines the need to control the quality and quantity of the waste water that is being discharged into the river, so as to maintain the desired quality of water. River in ecosystem has disturbed by the serious human intervention due to which the water quality and plankton richness has affected in a great extent resulting many fish species are now in the category of endangered. Fishes being very important for food and the economy is a point of major interest by many researchers throughout the world.

**Keyword:** Limnology, pollution, hydrology, physico-chemical parameters.

## OP-08

## HIGH PERFORMANCE THIN-LAYER CHROMATOGRAPHY AND UV SPECTROSCOPY: THE PERFECT ANALYTICAL TOOL FOR CHEMOPROFILING AND ANTIOXIDANT POTENTIAL OF MEDICINAL PLANT DRUGS: LEUCAS ASPERA AND DIGITALIS PURPUREA

**Rakhi Mishra1, 2*, Binit Dwivedi1, Deepshikha Gupta2, Manoj Kumar1 and Anil Khurana1**
1DDPR, Central Research Institute for Homoeopathy, A-1/1, Sector -24, Noida - 201 301, Uttar Pradesh
C.C.R.H, Ministry of AYUSH, Govt. of India
2Amity Institute of Applied Sciences, Amity University Noida, Uttar Pradesh
*rakhimishra020@gmail.com

Complementary and alternative system of medicine (CAM) like Ayurveda, Yoga, Unani, Siddha, Naturopathy and Homeopathy helps to sustain life of ecosystem and give positive contribution towards the environment and life that is why with time acceptance ratio of CAM system of medicine increases. Furthermore many herbs are genetically multioriginated or confused by substitutes / adulterants due to the morphological similarity resources shortage. The big challenge is to establish quality control standards for raw material and standardization of finished drugs. Moreover as Homeopathic drug are easily available over the counter and marketed under the claims of being a medicinal values, standardization of these drugs and assurance of authenticity of the ingredients used holds prime importance. The variation thus, caused by the use of improper raw materials or adulteration can bring about serious effects. With the development of advanced analytical instruments and technologies such as HPTLC and UV spectroscopy like analytical techniques are extensively used in the quality evaluation of Homeopathic drug. Digitalis purpurea commonly known as Foxglove, family-Plantaginaceae, is a well-known plant for cardiac glycosides and in homeopathy it is mainly used for prevention of congestive heart failure whereas Leucas aspera commonly known as Thumbai, family- Lamiaceae, is a well-known plant for antidote to snake venom, and in homeopathy it is mainly used in the treatment of cough, asthma, dysentery, jaundice, intermittent fever, bite of venomous animals, enlargement of the liver and spleen. In our present study, a combination of HPTLC and UV spectroscopy was applied for the identification and separation of triterpenic isomers oleanolic acid and ursolic acid in Leucas aspera and glycosidic digitoxin in Digitalis purpurea. As oleanolic and ursolic acid are isomeric triterpenic acids and only one methyl’s position is different between them so they are difficult to separate in HPTLC. The aim of this work is to develop a suitable mobile phase in HPTLC for determination of isomers oleanolic and ursolic acid from L. aspera and digitoxin from D. purpurea in-house prepared mother tinctures and commercial market samples. In Antioxidant study DPPH assay, total phenolic content, total flavonoid content and FRAP assay were measured which shows high content of antioxidant activity in mother tinctures of L. Aspera and D. purpurea. Results of antioxidant study of L. Aspera and D. purpurea obtained by UV spectroscopy are further validated by HPTLC instrument. The present HPTLC method is beneficial in terms of the time taken and the amount of solvent used for the separation of isomers thus promoting further research in the quantification study of active compounds of L. Aspera and D. purpurea.

**Keywords:** Leucas aspera, Digitalis purpurea, Homoeopathic drug, HPTLC fingerprint.

## OP-09

## MULTI-LAYER QUALITATIVE APPROACH TO REVEAL DECADAL CHANGES IN LAND USE/LAND COVER IN JHANSI, INDIA, USING OPEN ACCESS SATELLITE DATA AND GEOINFORMATICS

**Kamlesh Kushwahaa, M.M. Singha, Adesh Patela, Sudhir Kumar Singhb***
aInstitute of Earth Sciences, Bundelkhand University, Jhansi- 284128, Uttar Pradesh, India
bK. Banerjee Centre of Atmospheric & Ocean Studies, IIDS, Nehru Science Centre University of Allahabad, Prayagraj-211002, Uttar Pradesh, India

Jhansi is the historical and the most southern district of state Uttar Pradesh, India. It lies between the 25°26'-25°43' N latitude and 78°34'-78°56' E longitudes. The total geographical area of Jhansi district is 5024.00 km2. Present study covers main Jhansi City. The land use/land cover of the city and its surroundings has been rapidly changing and imposing pressures to the remaining land areas and environment. In this work we have used multi-layer qualitative approach to know about different values and to understand the changes in land use/land cover using Landsat satellite data of the year 1998-2008-2018. The values and changes have been determined by using Geoinformatic techniques. The results showed that built-up area increased by 13% i.e. from 31% in 1998 to 44% in 2018 of the total study area while water bodies and other classes losing its areas. The reasons of change are rising population, its excellent habitable geographical location, groundwater availability, center point of north-south and east-west corridor through Rail and Road etc. Due to these attractive reasons, most of the land areas have been converted into built-up. Hence this work will be useful to town planners, resource managers and local policy makers.

**Keywords:** Land use/land cover changes; Toposheet; Satellite Data; Multi-Layer Qualitative Maps

## OP-10

## INVESTIGATION OF DECADAL CHANGE IN LAND USE/LAND COVER OF VARANASI DISTRICT, INDIA, USING MULTI-TEMPORAL EARTH OBSERVING DATA SETS

**Sudhir Kumar Singha*, Kamlesh Kushwahab, Adesh Patelb**
AK. Banerjee Centre of Atmospheric & Ocean Studies, IIDS, Nehru Science Centre
University of Allahabad, Prayagraj-211002, Uttar Pradesh, India
bInstitute of Earth Sciences, Bundelkhand University, Jhansi-284128, Uttar Pradesh, India

The district Varanasi is a spiritual city of India. It is situated on the bank of the Ganga River. Most of part of the district is covered by the agricultural area which is the most dominant class of land use/land cover of the study area. The district witnessed the large transformation over the period of study. The earth observation satellite data of Landsat series were used for identification of changing in land use/land cover from 1998-2008-2018. The study has investigated land transformation of agricultural area into built-up. The results indicate that the agricultural area is decreased by 2% i.e. from 87% in 1998 to 85% in 2018 of the total study area and the area of vegetation reduced by 1% also in same given period while the area of built-up is increased by 2 % i.e. from 3% in 1998 to 5% in 2018 of the total study area. Rising population, reducing vegetation cover and unsustainable development leads to serious environmental concern. Hence this research work will be beneficial to local policy makers, town planners, and in further research of study area.

**Keywords:** Land use/land cover changes; Satellite Data; Multi-Layer Qualitative Maps

## OP-11

## THREATS INSIDE YOUR SWEET HOME

**Madhumita Bhattacharjee**
Department of Botany, P.G. Govt. College for Girls, Sector -11, Chandigarh – 160012, India

With the changing modern life style our sweet home is becoming sick home now a day due to indoor pollution. Air tightness of buildings, poorly designed air conditioning and poor ventilation systems are the some root cause of indoor pollution. Most of the scientists focus on outdoor pollution, but indoor pollution may even be more dangerous for our health. A number of air pollutants have been recognized to exist indoors, including NO2, SO2, O3, CO, chlorinated organic compounds, volatile and semi-volatile organic compounds (VOCs), radon, asbestos, man-made mineral fibres, fungi, mold, mildew, airborne bacteria, house dust and mites etc. These pollutants mainly originate from carpets, sofas, paneling, furniture, paints, plastics, perfumes, air fresheners, tobacco smoke, household cleaning products, personal care products, furnaces, stoves, fireplaces and vents etc. The major health hazards by these pollutants are headache, dizziness, breathing irregularities, lung cancer, asbestosis, lung cancer, heartbeat irregularities, nausea, irritation of throat, eyes, and lungs, nervous disorders, kidney and liver damage, allergies, coughs, sneezing, eye irritation, sore throats, difficulty breathing, dry skin, nasal congestion, nose bleeds, flu-like symptoms etc. To keep away the indoor pollution from your sweet home use low-toxicity materials, monitor air quality, keep rooms clean, limit exposure to chemicals, allow for better mixing of indoor and outdoor air, use natural gas for fuel, maximum use of natural ventilation etc. We can also keep few plants to reduce indoor pollution like aloevera, spider plant, gerbera, golden pothos, warneck dracaena etc.

**Keywords:** spider plant, golden pothos, VOCs, indoor pollution

## OP-12

## COMPARATIVE STUDY OF LARVICIDAL POTENCY OF SOME COMMON NATIVE FISH SPECIES ON THE BASIS OF GENDER

**Mohammad Ishfaq Wani* and Sarita Shrivastava**
Department of Zoology, Government Science Model College Gwalior
Ishfaqzoology12@gmail.com

From 1900 centaury, mosquito control has become a point of focus in scientific communities epically health providing units. All tropical and sub-tropical countries have to face mosquito borne diseases every year like dengue fever, malaria, filariasis, japanese encephalitis etc. In order to overcome the vectors of these dreadful diseases at source level various chemical methods have been employed so for but have certain environmental issues. Biological is the best alternative, cost effective, and eco-friendly method for mosquito control at source level. Present study is focused on using some common native fish species of Gwalior (M.P) as predator of mosquito larvae. All Predation experiments were conducted against mosquito larvae, pupae and alternative food (zooplankton) at varying pray densities in separate aquariums containing analysed pond waters of Jal-vihar and fish form of Gwalior (M.P). The duration of each predation experiments is one week, and in each day of the week, fishes were fed with mosquito larvae, pupae and alternative food at varying densities at different time intervals of a day. The study revealed that, Larvae consummation was positively related with the small fish species having female gender and prefers mostly small pray as food. Thus, small sized female fish species possess greater predation efficacy on mosquito larvae and the sequence of predation potency of female fish species was noted in the present study is Punitus ambassis>Ompak bimaculatus> Chana murulius> Heteropneustes fossalis.As per the results of our study, it is predicted that females have greater value of larvicidal potency than that of males. Thus, female gender plays an important and positive role of mosquito biocontrol at source level.

**Keywords:** zooplankton, Gender, biocontrol, potency, eco-friendly.

## OP-13

## PHYSCIO – CHEMICAL PARAMETERS FOR ASSESSING THE WATER QUALITY OF THE SAHASTRADHARA RIVER, DEHRADUN

**Muhammad Younis Sheikh1 and Sameer Ahmad Thoker2**
1School of Studies in Environmental Science, Jiwaji University, Gwalior
2School of studies in Botany Jiwaji University Gwalior
sheikhyounis18@gmail.com

Sahastradhara stream is a major tributary of river Song, 15 Km. far from Dehradun city in Uttarakhand. It has a great importance as a picnic tourist spot of the region, whereas there is not much industrial





and agricultural pollution. Hill streams of the area are the cradle of nutrients especially calcium and magnesium in the form of ions. Anthropogenic factors mainly tourists activities and catchments runoff may influence the index of nutrients in stream water. Nutrients play a vital role into niche restoration maintenance, self-regulation and water quality. Location variation in nutrients concentration of the stream was studied with special reference to correlation with physico-chemical parameters of the stream water. Calcium and Magnesium were observed in higher range in Sahastradhara stream as comparison to other hill-streams. Calcium and Magnesium were found maximum 221mg/l and 84 mg/l respectively in summer season.

**Keywords:** Sahastradhara, Water quality monitoring, physico-chemical parameters

## OP-14

## ANALYSIS OF CROCUS SATIVUS (SAFFRON) IN THE PREVENTION OF CYSTIC FOLLICLES AND ADENOMYOSIS IN RATS.

**Haroon Bashir Zargar**
Sri Satya Sai University of Technology and Medical Sciences, Sehore (M.P.) 466001
haroonzargar24@gmail.com

To evaluate the antifertility activity of Crocus Sativus on female rats. The plant extract was tested for its effect on implant formation at two dose levels, 300 and 600 mg·kg−1, respectively. The effective methanolic plant extract was further studied for estrogenic potency on ovariectomised immature female rats. The data presented in this study demonstrate the antifertility potential of Crocus Sativus methanolic extract, which shows a strong and significant decrease in implant formation (100%), and a strong estrogenic effect resulting in a significant increase in uterine weight in immature ovariectomised rats. These observations suggest that the methanolic extract of Crocus Sativus has strong anti-implantation activity and estrogenic activity.The methanolic plant extract of Crocus Sativus has antifertility activity.

**Keywords:** Crocus Sativus; Cystic follicles; Adenomyosis; Antifertility.

## OP-15

## ISOLATION AND IDENTIFICATION OF LIPOLYTIC BACTERIA FROM OIL CONTAMINATED SOILS IN GWALIOR

**Charu Singh*, Ramendra Singh Parmar, Pragya Jadon and Ajay Kumar**
Dept. of Life Sciences, ITM University, Gwalior (M.P.), India
cmbjadon@gmail.com

Lipases are serine hydrolases and catalyze both the hydrolysis and synthesis of long-chain triacylglycerols. In present study an isolate (LG-13) has been isolated from oil contaminated soil samples from Gwalior, MP. Lipolytic bacterial isolates were grown on tributyrin agar media (TBA) containing 1% (w/v) olive oil. In primary screening, total 15 different isolates showing lipolytic activity. In secondary screening, out of 15 isolates, LG-13 isolate showed maximum zone of clearance on TBA media. LG-13 isolate was morphologically and biochemically identified using Bergey's Manual. Different media parameters were also optimized to maximize the production of lipase enzyme. Peak lipase activity was observed for palm oil as carbon source, peptone as nitrogen source, at pH 7.0, temperature 37°C at agitation speed of 180 rpm. Besides their industrial application possibilities, the lipases are linked to the deterioration of some products, mainly dairy products and oils. From the industrial point of view these are considered very important, due to their great production potential on a large scale and to the capacity of deterioration of microorganisms.

**Keywords:** Lipolytic activity, Lipase enzyme, tributyrin agar media, zone of clearance, hydrolases.

## OP-16

## COMPONENTS OF PERCEIVED STRESS OF WOMENWORKINGIN MALE DOMINATED ORGANISATION

**Rumiya Agashe**
Vikrant Group of Institution,Gwalior.

Women working in traditionally male-dominated fields and occupations continue to face problems due to various reasons. The cause of stress that these women have at work is not restricted to the type of job but also to stigmas that prevail in male dominated industries. The stress is caused due to various stressors –both physical and mental. This paper identifies key perceived stressors that prevail for women working in male dominated industries with special reference to Women Officers in Indian Armed Force. Organisations like Indian Armed Forces have opened several new opportunities for women in both operational and administrative branches. Though the organisation has left no stones unturned to remove bias or favouritism for majority groups like gentlemen officers, women working in this organisation feel stressed as minority groups. Total of 125 women officers of Indian Armed Force volunteered to participate in the study. Exploratory factor analysis revealed 4 factors significantly constitute perceived stress in women officers of Indian Armed Force and these are 1. Stereotype threats (perceived threat from majority), 2. Anticipated Rejection, 3. Stereotyping notions about majority (men), 4. Stigma Consciousness. Understanding of these perceived stressors might help both women employees and the organisation to develop a more friendly and healthy work environment. The validity of the study may extend to similar male dominated industries like other military organisations, aviation industry, oil and automobile industries etc.

**Keywords:** Perceived Stress, Stressors, Armed Forces, Gender Bias, Minority Threats. Gender Stigma



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## OP-17

## EFFICIENCY OF MACROPHYTE FOR TREATMENT OF MUNICIPAL SOLID WASTE LEACHATE IN AN UPWARDS FLOW CONSTRUCTED WETLAND SYSTEM

**Mukesh Ruhela1*, Rakesh Bhutiani2 and Faheem Ahamad3**
1Department of Environmental Engineering (SITE), Swami Vivekanand Subharti University, Meerut-250005, (UP), India.
2Limnology and Ecological Modelling Lab. Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar-249404 (UK), India
3Keral Verma Subharti College of Sciences (KVSCOS), Swami Vivekanand Subharti University, Meerut-250005, (UP), India.
mruhela@gmail.com

Constructed wetlands are one of the effective treatment technologies that have been used to treat various kinds of wastewater and leachate and are very economical and cost-effective, simple and easy to operate, without any complex technology. The BOD5/COD ratio of raw leachate was observed as low (0.27), indicating it as biodegradable leachate. That's why for the treatment of this leachate, CW's methods are used. The main objective of the present study is to assess the efficiency of CW's for the treatment of landfill leachate. To fulfill the objectives of the present study an upwards flow engineered wetland was constructed using gravel, sand and plant (Pistia stratiotes). The efficiency of CW's was assessed for 21 parameters such as TDS, COD, BOD, NH4-N, Fluoride, TKN, and Heavy metals, etc. The maximum removal efficiency was observed in the case of BOD (97.58%) followed by COD (97.03%), Turbidity (87.09%) and Sulphate (85.89%) while minimum efficiency was observed in case of pH (8.24%). Due to the large removal efficiency observed in the present study and based on literature, it can be said that CW's methods would play a major role in the sustainable management of wastewater.

**Keywords:** Constructed wetlands, Leachate, municipal solid waste (MSW), upward flow.

## OP-18

## HYDROBIOLOGICAL ASSESSMENT OF TUMARIA RESERVOIR WITH IN KASHIPUR, DIST- UDHAM SINGH NAGAR WITH SPECIAL REFERENCE TO PLANKTON DIVERSITY

**Pramod Kumar and Radhe Shyam**
Department of Zoology Govt. Degree College Nainidanda, Pauri Garhwal, Uttarakhand, 246277
drpramodkumar1975@gmail.com, radhey.8088@gmail.com

Biodiversity is the variability among living organisms, including genetic and structural difference between individual and within and between individual and within and between species. Biodiversity in a reservoir is the definitive indicator of the potential of reservoir. India is one of the mega biodiversity

nations in the world and occupies the ninth position in terms of fresh water mega biodiversity. The present study is basically focused on plankton diversity of Tumaria reservoir. Study was conducted from January 2017 to December, 2017. The qualitative evaluation of plankton (both phyto plankton and zooplankton) was analyzed. In phytoplankton diversity Chlorophyceae (53%) was most dominant group among all. Chlorophyceae was followed by Bacillariophycae (42%) and Cyanophyceae (5%). In Zooplankton diversity it was revelaed that rorifera (40%) was dominant group followed by protozoa (34%) cladocera (23%) and copepod (3%). It was also found that most of the plankton diversity was maximum during winters and minimum during the monsoon season. Some selected physico-chemical parameters viz. temperature, pH, turbidity, transparency, total solids, total dissolved solids, total suspended solids, conductivity, dissolved oxygen, Hardness, Calcium, chlorides and alkalinity were also monitored during the study period. In present study it was also revealed that the water of Tumaria reservoir is being polluted by direct contamination of local people, and other anthropogenic activities viz. cattle wasted is charge, unscientific method of fishing etc.

**Keywords:** Zooplankton, Phytoplankton, Biodiversity, Tumaria reservoir.

## OP-19

## ICHTHYO-FAUNAL DIVERSITY OF KOSI RIVER AT GARJIYA MATA MANDIR, RAMNAGAR (NAINITAL) UTTARAKHAND INDIA

**Pramod Kumar, Atul Upreti and Neelam Saini**
1. Department of Zoology T S R Govt. Degree College, Nainidanda, Pauri Garhwal, Uttarakhand (INDIA)
2. Deptt. Of Zoology Govt. P G College Nagpur, U S Nagar Uttrakhand
3. Department of Zoology, Sri Sai Degree College, Jaspur, Uttarakhand (INDIA)
drpramodkumar1975@gmail.com, neelamsarveshsaini999@gmail.com

Present study deals with fish biodiversity undertaken during one year period January 2018 to December 2018 in the Kosi river at Garjiya Mata Mandir, Ramnagar Nainital. In the present study the total 18 fish species (Barilius bendelisis, Cyprinuscarpio, Garragotyla, Tortor, Torputitora, Catlacatla, Labeorohita, Labeofimbriatus, Puntiusticto, Puntiussophore, Schizothoraxintermedius, Botiyalohachata, Botiyaalmorhae, Lepidocephalichthysguntea, Channamarulius (younger), Channapunctatus, eel and Xentodoncancila) were identified belonging to five families (Cyprinidae, Cobitidae, Channidae, Belonidae and Anguilli formes). The Cyprinidae was dominant to the other family, in which family Cyprinidae contributes 61%, Cobitidae contributes 17%, Channidae contributes 11%, Belonidae contributes 5% and Anguilli forms contributes 6%.

**Keywords:** Fish fauna, Kosiriver, Garjyamataman diretc.



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## OP-20

## EFFECT OF CLIMATIC FACTORS ON PLANKTON DIVERSITYOF PAGARA RESERVOIR, DISRICT MORENA (M.P.)

**Rakhi Uchchariya* and Dushyant Kumar Sharma****
Department of Zoology, Govt. Model Science College, Gwalior, M.P.
*1987rakhiuchchariya@gmail.com, **dushyant3268@gmail.com

Pagara dam is a composite dam. It is situated on Asan river at about 13 Km from Jaura town of Morena District of Madhya Pradesh. The dam was constructed for irrigation of the nearby villages. But, at present, the water of the dam is also used for drinking purpose. The water of the dam is also used for fish culture by fishery department and local fishermen. A study was carried out to access diversity of planktons of Pagara reservoir, Morena, Madhya Pradesh, India for the period June 2017 to May 2018. Total 20 species of phytoplanktons and 24 species of zooplankton were identified during the study period. Phytoplanktons belonged to six groups: Chlorophyceae, Bacillorophyceae, Myxophyceae, Cyanophyceae, Euglenop-hyceae and Dinophyceae. Chlorophyceae was the most dominant family with 9 species and Dinophyceae was the least dominant family during the study period. Chlorophyceae generally grow in fresh water body and indicates the purity of the water. The high number of chlorophyceae in Pagara indicates that the water is quite suitable for drinking purpose. The 24 species of zooplanktons belonged to four different groups i.e. Protozoa-4 species, Rotifera-12 species, Cladocera-5 species and copepod-3 species. Rotifera was found to be the most dominant group, followed by Cladocera and Copepoda. Protozoa was the least dominant. Climatic factors such as Air temperature, Humidity and Rainfall were noted for the study period and plankton diversity was analyzed in relation to these factors. The study reveals that diversity of both zooplanktons as well as phytoplanktons was influenced by climatic factors. Most of the phytoplanktons increased during summer season and decreased during winter. Zooplankton quantity was high during winter season and low during summer season.

**Keywords:** Pagara reservoir, Climatic factors, Asan river, Phytoplanktons, Zooplanktons.

## OP-21

## MANAGEMENT OF ROOT-KNOT NEMATODE, MELOIDOGYNE INCOGNITA, USING PLANT EXTRACTS OF MEDICINAL PLANTS

**Monika Singh and Rajendra Singh**
Plant Nematology Research Lab. Department of Zoology, Bareilly College Campus, MJP Rohilkhand University, Bareilly-243005
singh.rajendra007@gmail.com

Plant parasitic nematodes are major constraints in crop yield. These worms are found in root zone of plants and inhibit their growth and yield. Root knot nematode, Meloidogyne incognita is one of the

most important parasitic infecting more than 3000 plant species. Different methods were found to be effective in controlling the population density of this parasite. But an ecofriendly approach to inhibit their number has been tested here in this experiment. Ten different indigenous plants were collected from Rohilkhand region of western Uttar Pradesh province of India. The plant parts were dried in shade and powdered. Botanical extracts were prepared by Soxhlet apparatus using acetone as a solvent. Different doses of acetone extracts of these plants were screened in-vitro for egg hatchability and larvicidal activity against second stage juveniles of M. incognita. The mature egg masses and juveniles (J2) were exposed for 24, 48 and 72 hrs in different concentrations (10 ppm to 100 ppm) of botanical extracts. The plant extracts of Adhatoda vesica (Vasaka) and Nerium oleander (Lal Kaner) exhibited highly promising 100% larval mortality after 72 hrs of exposure followed by extracts of Melia azedarch (Bakain), Ocimum sanctum (Tulsi) and Simarauba glauca (Lakshmitaru). Canabis sativa (Bhang) and Datura stramonium (Datura) along with Adhatoda and Ocimum were found to potent to inhibit the egg hatching. Different concentrations of leaves extract of Vinca rosea (Sadavahar), Withania somnifera (Ashwagandha) and Solanum nigrum (Mokoi) were also found to be effective in reducing the egg hatching and to kill the second stage juvenile in in-vitro conditions at different hrs of exposures. The data of egg hatching and larval mortality have been analyzed statistically.

**Keywords:** Meloidogyne incognita, Botanicals, Adhatoda vesica, Nematicidal, Larval mortality

## OP-22

## DEVELOPMENT OF MICROMUTANTS IN GREEN GRAM INDUCED BY CITY WASTE WATER OF BAREILLY

**Asha Rani**
Department of Botany, Bareilly College, Bareilly, U.P.
asha.alig@gmail.com

Mung bean (Vigna radiata) is a important crop of northern India. For the experiment two varieties of mung bean viz NM-1(Narendra moong -1) and PTM-2 (Pantnagar moong-2) were obtained from the Seed Department of Pantnagar University,Pantnagar for mutagenic experiment. The effluent of city waste water is obtained from the outlet of B.D.A. colony nalah near Gulab Rai Inter College. Different con.of city waste water (80%,90% and 100%) were prepared with tap water.These seeds were irrigated with different con. of city waste water at the interval of 3 days.Heavy metals which are present in city waste water found toxic to mung bean plants. Clean, healthy and uniform sized seed have been sown to raise M1 generation.City waste water was found toxic to mung bean on different growth parameters in M1 generation. The seeds from each M1 plant collected on the individual plant basis from treated population and were sown in separate singly row design to raise M2 generation along with control in which micromutations are found. In different treatments the data was collected for five quantitative characters i.e. number of pods per plant, no. of seeds per pod, no. of seeds per plant, hundred seed weight per plant and total grain yield per plant. All the morphological mutants were eliminated from the sample taken for the study of these above mentioned five characters. The shift



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in mean and variance were worked out for each character and there is a significant change in mean values and increase in variance was observed in all the treatments of both the varieties.

**Keywords:** City Waste water, Micromutants, Phytotoxic effects, Mean, Variance.

## OP-23

## NEW SOLVENTS FOR CO2 CAPTURE

**Shashi Bala**
Department of Chemistry, Kerla Verma Subharti College of Science, Swami Vivekanand Subharti University Meerut, U.P., India
shashibala76@gmail.com

Rapid change has been observed in atmospheric composition over the past century including rising levels of particular gases such as CO2 and SO2. These changes have been driven largely by emissions from fossil fuel combustion, industry, biomass burning, and intensive agriculture.1 Carbon dioxide emissions are estimated at 6 GtC/year from fossil fuels alone.2 Carbon capture and storage technology has the potential to mitigate the excess CO2 generated from various sources, such as coal-fired power plants and the cement industry, from entering the environment. Amongst existing capture processes, solvent absorption is the preferred option for removing CO2 from industrial waste gas streams due to its cost and energy efficiency.3,4 Presently, 30% aqueous monoethanolamine is used for capturing CO2 from the flue gas streams. In this process, the solvated amine comes into contact with the flue gas and forms carbamate and carbonate salts.5 Although monoethanolamine has several advantages such as low cost, high reactivity and high absorption capacity by mass, the formation of stable salts requires high energy input to recover the CO2, making this system thermodynamically inefficient. Monoethanolamine also forms corrosive and toxic degradation products during the capture process which diminish the chemical activity and cycling capacity of the amine as well as incurring additional plant maintenance costs. As such, there is a vital need to find alternatives to the monoethanolamine solvent system which would overcome the disadvantages highlighted. Using a simple technique, developed in our laboratory, we measured the desorbed CO2 volume from an absorbent and define its CO2 capture capacity. In this study we have examined a series of compounds with different functional groups and compared them to the industry standard. These solvent systems are alternatives to the monoethanolamine solvent system which show better absorption capacities and fewer degradation products whilst maintaining economic viability, commercial availability, low volatility, low cost and toxicity.

**Keywords:** Greenhouse gases, CO2 capture solvent, Monoethanolamine

## OP-24
## RISKS ASSOCIATED WITH PESTICIDE USE

**Javid Manzoor and Khursheed Ahmad Wani**
Department of Environmental Science, JJT University, Jhunjhunu, Rajasthan, India
Department of Environmental Science, GDC, Bijbhara, J&K, India.
javaidevs@gmail.com

Risks related with pesticide use have outperformed their useful impacts. Pesticides have severe effects on non-target species, distress animals and plant biodiversity, aquatic as well as terrestrial food webs and ecosystems. Around 80–90 % of the applied pesticides can volatilize within a couple of days of use. It is very normal and liable to happen while utilizing sprayers. The volatilized pesticides evaporate into the air and may cause harm to non-target life forms. A good example of this is the utilization of herbicides, which volatilize off the treated plants and the vapors are adequate to make serious harm to different plants. Uncontrolled utilization of pesticides has resulted in reduction of a several terrestrial, aquatic animals and plant species. They have also undermined the endurance of some rare species, for example, the bald eagle, peregrine bird of prey and osprey. Moreover, air, water and soil bodies have also being contaminated with these chemicals to harmful levels. Among all the categories of pesticides, insecticides are viewed as generally lethal though fungicides and herbicides are second and third on the harmfulness list. Pesticides enter into the natural environment by two unique methods relying on their solvency. Water solvent pesticides get break down in water and enter ground water, streams, waterways and lakes subsequently causing harm to untargeted species. Then again, fat dissolvable pesticides enter the groups of animals by a procedure known as “bioamplification”. They get absorbed in the fatty tissues of animals hence resultingin persistence of pesticide in food chains for extended periods of time.

**Keywords:** Pesticides, animals, ecosystem, harmful.

## OP-25
## EFFICIENCY OF AZADIRACHTA SP. IN COMBINATION WITH SAND AND GRAVEL FOR WASTE WATER TREATMENT

**Faheem Ahamad, Rakesh Bhutiani and Mukesh Ruhela**
Department of Environmental Engineering, Swami Vivekananda Subharti University, Meerut (UP), India
Limnology and Ecological Modelling Lab. Department of Zoology and Environmental Science, Gurukula Kangri Vishwavidyalaya, Haridwar (UK), India
faheem.ahamad170390@gmail.com

Nearly 80% of the water supplied used by the society returns as wastewater in the sewer system as sewage. Sewage carries hazardous chemicals and high loadings of organic matter referred as BOD, COD and solids which include both dissolved and suspended solids. Prior to discharge into rivers,sewage must be treated to reduce the organic loads or else the aerobic bacteria there will consume more dissolved oxygen (DO) from river water to decompose organic materials there by depleting the DO values. Comparing other methods of waste water treatment, phyto filtration isan eco-friendly approach having low construction and maintenance cost and has considerable capability of wastewater treatment. The current research was focused mainly on the potential of Neem leaves based absorbent for wastewater treatment by designing reactors. Parameters like pH, COD, BOD, TS, Turbidity and TDS were analysed during the study period in the sewage collected from the STP, Haridwar. After successive treatments from leaf based absorbents, a considerable improvement in the water quality was observed. Efficiency of Neem leaf based absorbent was fairly good for parameters like turbidity removal which was showing reduction up to 80%.

**Keywords:** Neem leaf absorbent, industrial waste water, treatment, turbidity.

## OP-26
## ASSESSMENT OF GROUNDWATER QUALITY FOR DRINKING PURPOSE BY USING WATER QUALITY INDEX (WQI) IN AROUND LAKSAR DISTRICT HARIDWAR UTTARAKHAND

**Rakesh Bhutiani and Khushi Ram**
Limnology and Ecological Modeling Lab. Department of Zoology and Environmental Science Gurukula Kangri Vishwavidyalaya, Haridwar
khushi2013ram@gmail.com

The present work is aimed at assessing the water quality in and around Laksar block of district Haridwar Uttarakhand using water quality index (WQI). For this the ground water samples was collected and analyzed for Physico-chemical parameters. In the present study twelve water samples (two water samples from one village) was collected from six different villages of Laksar block and analyzed for the various parameters such as pH, Total hardness, Chloride, Total Solids , Total dissolved solids, Dissolved Oxygen and Sulphate were analysed as per standard methods. During the present study maximum value of TS (790.6±28.26 mg/l) was found at site S1, while the minimum value (705.3±5.59 mg/l) was found at site S4. The maximum average value of TDS (548.7±30.37 mg/l) was found at site S5, while the minimum value (352.8±5.59 mg/l) was found at site S4. The maximum average value of pH (7.8±0.58) was found at site S1, while the minimum value (6.9±0.70) was found at site S6. The maximum average value of DO (6.5±0.57) was mg/l found at site S4, while the minimum value (6.1±0.57) was mg/l found at site S6. The maximum average value of TH (396.9±65.94) was mg/l found at site S3, while the minimum value of TH (223.3±5.59mg/l) was found at site S4. The maximum average value of CaH (331.3±32.57mg/l) was found at site S1, while the minimum value of CaH (142.4±2.88mg/l) was found at site S4. The maximum average value of Chloride (137.3±8.72mg/l) was found at site S1, while the minimum Chloride average value (53.4±2.83mg/l) was found at site S4. The maximum value of Sulphate (45.11±0.78mg/l) was found at site S5, while the minimum value (28±2.24mg/l) was found at site S4.

**Keywords:** WQI, Physico- chemical parameters and Groundwater.

## OP-27

## NANOTOXICITY STUDIES- AN EMERGING CONCERN WITHOUT ROUTE AND PARAMETERS

**Kavya Dashora*1, GyanDatta Tripathi2, Zoya Javed2, Vinayak Fasake2, Mansi Mishra2**
Agri- Nanotechnology Laboratory, CRDT IIT Delhi-110016.
*Corresponding author- kdashora@rdat.iitd.ac.in

This century has started with the advance field of nanotechnology and major thrust area of research globally quickly transformed to become “Nano world”. We are using nanotechnology based products in our daily life like medical devices to fertilizers and transport to cosmetics.Nanoparticles may have distinctive surface properties and chemistries. As per United Nation’s annual report under Global Environment Outlook (GEO),nanotechnology based products share around 14 % of total products or $2.6 trillion by 2014, up from less than 0.1% in 2004 (UNEP, 2007).Asthe use of nanomaterials is increased and they are eventually released in the atmosphere.Most commonly used nanoparticles are not biologically degradable and therefore remain in the environment (soil, water and air).The unique properties of engineered nanoparticles not only confer essential benefits but also toxicity due to their unpredictable interactions with different biological compartments and cellular process. In last decade various studies conducted for analysis of the toxic effect of the nanomaterials. Nonotoxicity analysis studies are very limited and facing lack of direction. The problem became more challenging due to lack of parameters. The country like India, there is no regulatory guidelines available for nanomaterial uses and disposal which matter of concern. Government bodies are planning to set some guidelines but lack of parameters is biggest question for such issue. So it is necessary to defend certain parameters for toxicity studies of nanomaterials.

**Keywords:** Nanotechnology, Fertilizers, Nanotoxicity, Environment.

## OP-28

## VED AND ENVIRONMENTAL EDUCATION

**Hem Lata Khati**
Department of Education, RH Govt. P G College Kashipur
Email: hem_lata2007@yahoo.com

There are 12-14% people, which are the followers of HINDU DHARMA out of the whole population (approximately 4 billion) of the world. The Vedas are the oldest holy books of HINDUS and also the first texts in the library of mankind. In Vedas nature and the things which are given by the nature as heritage, have given an important relationship with us. . It is interesting to know that the ancient Vedas have several references in them on environmental protection, ecological balance, weather cycles, rainfall phenomena, hydrologic cycle, and related subjects that directly indicate the high level of awareness of the seers and people of the time. Vedas, ancient treasures of vast knowledge reveal a full cognizance of the undesirable effects of environmental degradation, whether caused by natural factors or human activities. All four major Vedas ‘the Rig, Sama, Yajur and Atharva Vedas’ recognize the importance of maintenance of the seasons’ cycles that are likely to get altered due to the climate change owing to inappropriate human actions. It is remarkable that the people in Vedic times regarded Nature and the environment in a holistic manner and revered each of its constituents and entities by carefully preserving them. “Do not harm the environment; do not harm the water and the flora; earth is my mother, I am her son; may the waters remain fresh, do not harm the waters. Tranquility be to the atmosphere, to the earth, to the waters, to the crops and vegetation.” This Vedic prayer invokes divine intervention to bless and protect the environment. In recent days, environmental science is a discipline of modern science under which study of environment and its constituents. As Science, they are established in 20th century, but their origin can be seen long back in the Vedic and ancient Sanskrit literature. The concepts of environment differ from age to age, since it depends upon the condition, prevalent at that particular time. Especially the Vedic views revolve around the concept of nature and life. But in the cut throat competitive race of scientific development and material achievement even we Indian have forgotten the altruistic naturalism of Rit( systematic rules of nature) and Sunrit (the Prosperous Survival of man Reference of Indra, Varuna, Diti, Aditi as the representatives of religious concern but also of scientific realization). This paper puts light on the Vedic conscience of accepting nature as a creative and protective power and also discusses the awareness of ancient Indian people about the environment.

**Keywords:** Ved, Environmental Education, Nature, water and the flora

## OP-29

## NON-NUTRITIVE BIOACTIVE COMPONENTS OF PULSES

**Deepika Goswami1*, Mridula D.1, R. K. Vishwakarma1 and Harshad M. Mandge2**
1Food Grains and Oilseeds Processing Division, ICAR-CIPHET, Ludhiana, Punjab (India)
2Banda University of Agriculture & Technology, Banda, U.P. (India)
*Email id: deepikagoswami@rediffmail.com

Pulses are mature dry seeds which are used for human consumption. These include pulses such as chickpeas or gram (Cicer arietinum), moong beans (Vignaradiata), pigeon pea also known as tur or arhar (Cajanuscajan), urd (Vigna mungo), masur or lentil (Lens culinaris), peas (Pisumsativum) and various kinds of beans. These are considered good source of protein, energy, fiber, and many essential vitamins and minerals. In India legumes, especially, pulses are major source of protein and aids to the nutritional value of carbohydrate rich diet of Indian cuisine because of their lysine content which is a limiting amino acid in cereals. Besides these nutritive componentspulses also contain some phytochemicals which are produced through secondary metabolism, have no role in direct metabolism of plants and hence not required for normal growth and development. However, these have a wide range of biological activities and aids in different biological or ecological functions in plants. In other words these are the non-nutritive bioactive components of pulses.Some of these compounds are toxic, unpalatable

or anti-nutritive for human consumption due to their abilities to block nutrients, inhibit metabolism or reduce digestion and are termed as 'anti-nutritional factors'and include protease inhibitors, phytic acid, polyphenols, α-amylase inhibitors, saponins, lectins, flatulence factors, goitrogens, allergens, cyanogenic glycosides etc.Distribution of these compounds in different components of pulses, their biological functions and/or anti-nutritional activity also varies. These bioactive compounds present in pulses generally decrease the palatability, reduce protein digestibility and mineral bioavailability thereby limit the biological value and acceptance of pulses in regular diet. Thus, the pulses need to be processed appropriately prior to consumption. There are several processing methods which are used for reduction/alleviation of these bioactive compounds in pulses such as dehulling, soaking, hydrothermal treatments, cooking, extrusion, germination, fermentation etc.

**Keywords:** Pulses, bioactive compounds, anti-nutritional factors.

## OP-30
## DETECTION OF AIR MICROBIAL DENSITY AND ITS CHARACTERIZATION WITHIN A PERIOD OF ONE YEAR

**Ankita Soni1* and Alok Kumar Soni2**
1Department of Zoology, Government College, Manawar, 454446, India
2National Institute of Pharmaceutical Education and Research, Mohali, 160062, India
* E-mail:soniankita486@gmail.com

Microorganisms flourish in the atmosphere of earth as particle or bacteria, fungi, lichen and algal cell. Generally, the concentration and composition of these microorganisms are related to man's activities. The present study was undertaken to determine typical microbial density of airborne bacteria and fungi (microflora) at the selected area of Gwalior city. Microbiological air sampling was carried out for a period of one year from January 2016 to December 2016 during work days, 12-18 days per month. Each day, the air samples were collected thrice, that is, in the morning, between 8am and 10am, in the afternoon, between 12am noon and 2 pm and in the evening between 4pm and 6pm. Air samples were taken with the HYCON RCS air sampler, drawing airborne microorganisms onto an agar media strips for later incubation and analysis. This air sampler operates on impaction principle. Air samples for determination of bacteria were taken on Nutrient Agar (NA) and air samples for determination of fungi were taken on Sabouraud Dextrose Agar (SDA). Mean monthly concentrations of total microorganisms (bacteria+fungi) in the air were between 1231-28300 cfu/m3. Mean monthly concentration of airborne bacteria ranged from 137.5-12837.5 cfu/m3, with peak values in July and the lowest values March and June. Mean monthly concentration of airborne fungi showed much greater variation than bacteria and ranged from 400-12425 cfu/m3 with the very distinct peak in November and the lowest value in May. The variations in monthly concentrations of total microorganism, bacteria and fungi were statistically significant ($p<0.01$). The isolated bacterial colonies were differentiated morphologically on the basis of colour, shape, edges, form, elevation, surface and margin; and further characterized using Bruker MALDI Biotyper. The most common bacteria in the air of the examined area were Staphylococcus xylosus, Bacillus cereus, Bacillus amyloliquefaciens, Staphylococcus arlettae, Bacillus megaterium, Bacillus licheniformis, Achromobacter insolitus, Bacillus vallismortis, Lactobacillus curvatus.

**Key words:** Air sampler, NA, SDA, MALDI Biotyper.



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## OP-31
## COMPARATIVE ANTIOXIDANT AND HEPATOPROTECTIVE APTITUDE OF PHYTOCONSTITUENTS FROM SOLANUM XANTHOCARPUM AND HEDYOTISCORYMBOSA

**Ramesh Kumar Gupta1,2,5*, Sudhansu Ranjan Swain1, Jagannath Sahoo3, Amresh Gupta4, Sheetanshu Gupta5 , Satya Prakash Singh5**
1Moradabad Educational Trust, Group of Institutions, Faculty of Pharmacy, Moradabad 244001, Uttar Pradesh, India.
2Shri Ram Murti Smarak College of Engineering and Technology, Bareilly 243202, Uttar Pradesh, India.
3School of Pharmacy, Krishna Institute of Engineering and Technology, Ghaziabad 201001, Uttar Pradesh, India.
4Goel Institute of Pharmacy and Sciences, Lucknow 226024, Uttar Pradesh, India.
5City School of Pharmacy, Barabanki, 225001, Uttar Pradesh, India.

The current study validates the isolation, characterization and determination of in-vivo antioxidant and hepatoprotective consequences of corycavidine and quercetin that were isolated from Hedyotiscorymbosa and Solanum xanthocarpum respectively. Quercetin was isolated from Solanum xanthocarpum by column chromatography employing n-butanol: acetic acid: H2O (2:2:6) as solvent system, however corycavidinewas isolated from Hedyotis corymbose by column chromatography employing chloroform: methanol: diethylamine (4:1:2.2) as mobile phase. Structural illustrationswere confirmed by UV, FT-IR, 1H-NMR,13C-NMR and mass spectroscopy. Both phytoconstituents were explored for their antioxidant potential by investigating CAT, SOD GSH and LPO in liver homogenates of experimental rats. Additionally, in-vivo hepatoprotective effect was examined against simvastatin (20 mg/kg, p.o.), induced hepatotoxicity in experimental rodents. The liver protective activity was assessed by determining hepatic biomarkers like SGOT, SGPT, ALP, bilirubin, total protein, cholesterol and urea along with haematological and histopathological studies. The results of spectroscopic methods confirmed that the isolated phytochemical constituent from the Hedyotiscorymbose is corycavidine, a benzoisoquinoline alkaloid, however from Solanum xanthocarpumis quercetin a flavonoid. Both phytoconstituents significantly at ($P<0.05$-$P<0.001$) and dose-dependently reversed simvastatin induced biomarkers and restored the total protein and albumin level in experimental rats. Furthermore, it also signifies the blood parameters at dose of 50 and 100 mg/kg and restored the body protection system. The histological examination exhibited that corycavidine and quercetin at dose of 100 mg/kg showed better outcomes. The results expressed hepatoprotective outcome of quercetin is preeminentthan corycavidine and therefore, scientifically subsidize its traditional application.

Keywords: Hedyotis corymbose, Solanum xanthocarpum, Quercetin, corycavidine, Simvastatin.

## OP-32

## SATELLITE REMOTE SENSING DATA FOR ASSESSMENT OF LANDCOVER CHANGES OF KUNO WILDLIFE SANCTUARY, SHEOPUR, MADHYA PRADESH, INDIA

**1 Kush Kushwah, 2 Bidyalakshmi Phurailatpam and 3 R.J. Rao**
1 US ENVIRON, New Delhi
2 Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh
3 Barkatullah University, Bhopal, Madhya Pradesh
kush341981@gmail.com

Kuno Wildlife Sanctuary (KWS) situated between latitudes of 25°30'-25°53'N and longitude of 77°07'-77°26'E in the Sheopur District of north-west Madhya Pradesh, India. The total area of 1269 sq. km. is managed as Kuno Wildlife Division, Sheopur to host the introduced lion population of which about 924 sq.km. of the surrounding forest habitat of Sheopur Forest Division has been brought under the Kuno Wildlife Division besides the Sanctuary area of 344.686 sq.km. Kuno wildlife sanctuary obtained its name from the perennial river Kuno which bisects the sanctuary. The sanctuary is dominated by rich vegetation comprising of Khair, Kardhai, Dhawa, Salai, Gunja and mix forests. Apart from the floral diversity, it also has a rich fauna diversity of herbivorous. Remote sensing satellite data and Geographic Information System (GIS) techniques from recent times has been of immense help in monitoring changing patterns of a landscape. The present study aim at assessing the landcover of Kuno Wildlife Sanctuary of different periods during winter and summer seasons. Landsat images of 2008 for winter seasons and LISS III P6 of 2017 for summer seasons were utilized for the study. Unsupervised classification with ground truth method was used for the landcover classification. Change detection method using image classification statistics and NDVI calculation were applied. The study will be helpful in highlighting the different landcover changes during winter and summer seasons of almost 10years gap period.

**Keywords:** Landsat image 2008, LISS III P6 2017, Unsupervised classification

## OP-33

## A REMOTE SENSING AND GIS-BASED MODEL OF AVIAN SPECIES HABITAT OF TIGHRA RESERVOIR

**Bidyalakshmi Phurailatpam1, R. J. Rao2 and Kush Kushwah3**
Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh1
Barkatullah University, Bhopal, Madhya Pradesh2
US ENVIRON, New Delhi3
bidya_khoi2003@yahoo.co.in

A study has been conducted to identify the wetlands in Gwalior-Chambal region by using Remote Sensing and GIS technology. The present study has been conducted from December 2015 to January 2017 in Tighra reservoir, located 30 km west of Gwalior city at a latitude of 26o12'0"N and longitude of 78o30'0"E. The reservoir is a major source of drinking water for the Gwalior city and it is also a good tourist place including boat ride in the reservoir. The reservoir is a major habitat for large number of birds. Direct visual encounter method was used to observe the birds in the reservoir with the help of binoculars. GPS is used for mapping accurate coordinates of bird sightings. The collected data is then mapped on GIS software ArcGIS 9.1v. The Tighra reservoir served as the wintering ground for both residential and migratory birds. A total of 1057 birds belonging to 12 species of migratory and 13 species of residential bird were observed on a single day during January 2017. Important birds are: coots, flamingos, red crested pochards, pintail, spot bills, common pochards, gadwall, cormorants, shoveller, egrets, herons etc. There are about 1000 houses settling near the reservoir out of which 200 were fishermen. Human activities like bathing, washing clothes, fetching water, fishing, boating observed during the survey have adverse impacts on the migratory birds.

**Keywords:** Tighra reservoir, Migratory birds, ArcGIS 9.1.

## OP-34

## CLIMATE CHANGE REGIME AND IT'S IMPACT ON INDIAN LIVELIHOOD

**Gyan Prakash Morya and Kuldip Dwivedi**
Department. of Entomology, B.R.D.P.G.College, Deoria, U.P., India
Department of Environmental Science, Amity University Madhya Pradesh, Gwalior, India
Email: gyanprakash978@gmail.com, dwivedikul2012@gmail.com

India is a vast country occupying 2.4% world geographical area sharing 16.2% of the global human population and 15% of the global livestock population. It is endowed with varied climate supporting rich biodiversity and high diverse ecology. More than 60% of its population living in rural areas, where agriculture is the major source of rural economy and forms the backbone of Indian economy. The Indian economy is mostly agrarian based and depends on onset of monsoon and its further behavior. The livelihood of the rural people is directly dependent on climate sensitive natural resources like land, water and forests. The impact of climate change on these natural resources affect the agriculture, forests, water resources and human health. The impact of climate change on agriculture could result in problems with food security and may threaten the livelihood activities upon which much of the population depends. The climate change and global warming pose significant threat to agriculture. Pests population are strongly dependent upon temperature and humidity. It has been predicted that 10-40% losses in crop production in India with increase in temperature 3 to 5ºC by the end of 21 century (IPCC, 2007; Ninan and Bedamatta, 2012). Lower yields from dairy cattle and decline in fish breeding, migration and harvests are the possible impacts of climate change. Changes in climate may alter the distribution of important vector species and may increase the spread of vector borne diseases. The loss in net revenue at the farm level is estimated to range between 9% to 25% for a temperature rise of 2ºC to 3.5ºC (Kavi Kumar and Parikh, 1998; Kavi Kumar, 2010). This paper was attempted to review

the extensive studies on current trends of climate change and their impact on Indian livelihood.

**Keywords:** Climate change, Global warming, Livelihood, Agriculture, India.

## OP-35
## ILLEGAL SAND MINING IN NATIONAL CHAMBAL SANCTUARY, MORENA, MADHYA PRADESH

**Yogesh Singh and R. J. Rao**
Jiwaji University, Gwalior

Sand is used as an abrasive or in concrete. Sand mining is the extraction of sand, mainly through an open pit but sometimes mined from beaches and inland dunes or dredged from ocean and river beds. Madhya Pradesh is one of the worse affected states as far as illegal sand mining is concerned. Over the years unsustainable sand mining has caused great damage to Narmada and its tributaries. The Ken, Betwa, Sindh, Chambal and Son rivers which join Yamuna and Ganga rivers has also been facing severe threats from ongoing illegal sand extraction. Chambal River is one of the major tributaries of the Yamuna River. Located in Central India, the river comprises a significant portion of the Greater Genetics Drainage System. The Chambal River runs according to a north to northeasterly itinerary through Madhya Pradesh, flowing for a considerable distance through Rajasthan, subsequently creates the border between Madhya Pradesh and Rajasthan prior to twisting to the southeast to meet the Yamuna in the state of Uttar Pradesh. Major ecological studies on Crocodiles and freshwater turtles have been conducted in the Chambal River from 1983 onwards. The Chambal river Gharial population is the largest contiguous and most viable population and has been the focus of conservation and restocking programmes. During the past few decades natural sand has become expensive, due to excessive cost of transport from natural sources.

**Keywords:** Crocodiles and freshwater turtles, Sand, Chambal River

## OP-36
## WASTE WATER TREATMENT THROUGH INNOVATIVE ECO FRIENDLY TECHNOLOGY –A CASE STUDY

**Bidyalakshmi Phurailatpam1, R. K. Mahor2, Kush Kushwah3 and U.S. Sharma3**
Rajmata Vijayaraje Scindia Krishi Vishwa Vidyalaya, Gwalior, Madhya Pradesh1
Vrinda Sahay Govt. Post Graduate College, Dabra, Madhya Pradesh2
US ENVIRON, New Delhi3
bidya_khoi2003@yahoo.co.in

Wastewater in short, is the water that is discarded from various industries, factories, households, etc. to an inlet and contains various types of impurities and toxic substances such as sludge, stone, waste materials, besides heavy metals and radioactive materials. However these wastewaters are also reusable water which when properly recycled and purify through innovative eco friendly technologies can be used for various everyday purposes such as vehicle washing, gardening, etc., and also be discarded to the main inlet. One such innovative technology is a Japanese Eco Bio Block (EBB) system that uses eco friendly micro-organism embedded in a porous concrete block to treat and purify the wastewater drains, household wastewater including sewage, industrial waste, polluted rivers, ponds, lakes etc. The blocks are produced by infusing effective microbes with Zeolites a volcanic porous stones, alkaline cement and good water. Zeolites are utilized for maximum efficacy, as the microbes would multiply abundantly in these stones. All types of pollutants are the nutrition for these Embedded EBB microbes. The microbes/bacteria are able to live and propagate optimally in temperatures ranging from 25°C to 60°C and pH range of pH 3- pH 11. EB block act as the bacteria generator that always keep the amount of bacteria in balance with the concentration of organic matter. The micro organisms treat the wastes effectively in a faster manner and clean the water body without causing any harm to plants and fishes, since these pollutants are food for all these microbes. Accordingly, Central Pollution Control Board has carried out a Pilot scale treatment in 2007 using the Japanese ECO BIO BLOCK (EBB) Technology. The treatment performance was appreciated and characteristics reduction was 50% (average) as per CPCB records. Moreover the EBB has been used/tried in different Sewage Treatment Plant (STP) and Effluent Treatment Plant (ETP) in different states of India such as Gurgoan, Noida, Chennai, etc. It was found that the treatment efficiency is much higher than normal conventional treatment techniques used in STP's and ETP's. therefore from this study it was concluded here that since the EBB technology is highly effective and environmental friendly, those industries, factories, institutions, companies etc., generating wastewaters should used this type of innovative technology for treatment of their wastewater before discarding to the main inlet. It is hereby also suggested that such types of eco-friendly innovative technologies should be made compulsory by the governments to all the said industries, factories, etc.

**Keywords:** Wastewater, Eco-friendly technology, Eco Bio Block, CPCB

## OP-37
## AVIFAUNAL DIVERSITY AND CONSERVATION WITH SPECIAL REFERENCE TO ANTHROPOGENIC PRESSURE IN SHARDA BAL GRAM, GWALIOR, MADHYA PRADESH, INDIA

**Lodhi, R. K. and Rao, R. J.**
Conservation Biology Lab, School of Studies in Zoology, Jiwaji University, Gwalior
Ramkumarlodhi73@yahoo.com

Birds are the eminent creature of nature they used different types of habitat for feeding, nesting, and sheltering purposes. They are a group of endothermic vertebrates with a high metabolic rate, a four-chambered heart, and a strong lightweight skeleton. Avifaunal diversity plays a very important role

in determining the health of an ecosystem. The study was conducted over a period from July 2015 to June 2019. The bird species were recorded using point counts and line transects method where ever possible for studying avian diversity, population abundance and the impact of anthropogenic pressure on regional avian diversity. Anthropogenic pressure was observed in Sharda Bal Gram given value on a scale of 0 to 5 through personal observation. A total of 57 species belonging to 32 families and 13 orders were recorded during the study period. Of these, 25 species belong to the order Passeriformes which accounted for 45% of the total species, making it the order with the highest number of species. A total of 8% species accounted for migratory and 4% species of near threatened were recorded. This study provides baseline data for monitoring the avifauna in the University campus and demonstrates the importance of university campuses in bird conservation.

**Keywords:** Avifauna, Aboundance, Anthropogenic pressure, Shannon diversity.

## OP-38

## STUDY OF PM10 AND ITS EFFECTS ON THE POPULATION OF GWALIOR, INDIA

**Swapnil Rai1*, Gourav Kumar Singh2, Nimisha Jadaun3**
1,2Department of Environment Science, Amity University Madhya Pradesh, Gwalior 474005 –India
3SOS in Environmental Chemistry, Jiwaji University, Gwalior – India
Email: srai@gwa.amity.edu

One of the air pollutant indices includes particulate matter i.e. PM with aerodynamic diameter less than or equal to 10 µg/m3 (PM10). Particulate matter has extensive effects on the respiratory and cardiovascular systems. Dissemination or accumulation of such particles for a longer period can lead to increased mortality and hospitalization. In this study, the data of PM10 pollutant is gathered from the sample sites like DD Nagar, Gole Ka Mandir, Thatipur Chauraha and Railway Station. Furthermore, PM10 effects on the total mortalities, cardiovascular mortalities, respiratory mortalities, and hospitalizations caused by respiratory and cardiovascular diseases are analyzed by the questionnaire survey from the residents of the locality. The results reported the highest mean concentration of PM10 in the DD Nagar Region and Gole Ka Mandir. Moreover, it is estimated that the death is mainly caused breathing problems.By using the different statistical tools it is observed that industries and mining is the major source of Particulate Matter.Due to the lack of suitable database for recording death toll attributable to air pollutants, the software could be considered as an alternative for estimating the health effects of air pollutants.

**Keywords:** Air pollution; PM10; cardiovascular disease; respiratory disease, statistical tools.



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## OP-39

## SOLID AND LIQUID WASTE MANAGEMENT: AHIDDEN KEY FOR SUSTAINABLE DEVELOPMENT

**Radha Krishan Sharma**
N. M. S. N. Dass (P.G.) College, Budaun, 243601 (U.P.) India
rkskrish@gmail.com

Degradable and non-degradable solid garbage, effluents and sewage are the major issues of present times. The process of waste management is important for the good health of both public and environment. The sustainable development not only depends on appropriate use of various environmental resources but also on the proper recycling of different waste materials. In the present study dumping sites of some waste materials were studied. Degradable waste was observed as a major source of various fungal spores, which may cause health hazards. Non-degradable waste includes plastic materials, polythene of different thickness and other chemical impregnated materials. Liquid waste includes both organic and inorganic, dissolved and suspended materials. Possible measures were examined with the help of small laboratory models, field impact and preliminary data sources. Findings of present study indicate that interrupted mineral cyclingis a major drawback in sustainable development. Therefore, management of solid and liquid waste is the prerequisite for sustainable development.

**Keywords:** Mineral cycling, sustainable development, solid waste, liquid waste.

## OP-40

## DOUBLEING OF FARMERS INCOME THROUGH DIVERSIFICATION OF AGRICULTURE

**Vaishali Deshmukh**
Sau Vasudhatai Deshmukh college of food technology, Amravati.
vaishu.amravati@gmail.com

The strategy for doubling the farmers income through diversification of agriculture timeframe is from 2016 to 2022. In the last few years, a lot of things have been done. The first is that the Doubling Farmers' Income Committee's report has been accepted by the government, and it set up what is called an empowered body with official representatives from different bodies as also some non-official members. This body is now responsible for co-ordinating with different ministries, organisations and institutions and the State governments to implement it. And that work has begun. However, since the timeframe was limited, the committee made simultaneous recommendations to the government right from 2016 and their implementation began soon after. We have covered a lot of ground since then. How we are moving towards the goal, I can't say in quantifiable terms but I can say that we are in the right direction.
**Keywords:** agriculture, farmers, income, diversification.

## OP-41

## HETEROSIS AND COMBINING ABILITY ANALYSIS IN BARLEY (HORDEUM VULGARE L.)

**Deepak Pawar* N. S. Dodiya, Naval Singh Devra, Dalip and Hemlata Sharma**
Department of Genetics and Plant Breeding, Rajasthan, College of Agriculture, Udaipur 313001

The present investigation assessed the magnitude of heterosis and combining ability by using 47 crosses along with 9 parents and 2 checks viz., RD 2899 and BH 946, a total of 47 entries, were evaluated during rabi 2018-19 in Randomized Block Design (RBD) with 3 replications at the research farm of Department of Genetics and Plant Breeding, Rajasthan College of Agriculture Udaipur, (Rajasthan). The observations were recorded for 13 characters to study the magnitude of relative heterosis (RH), heterobeltiosis (HB), economic heterosis (EH) general combining ability (GCA) and specific combining ability ( SCA) effects. The analysis of variance revealed that mean squares due to genotypes, parents and crosses were significant for all the traits except days to 75 per cent maturity. While mean squares due to for parents v/s crosses were significant for flag leaf area, number of grains per spike, grain yield per plant and protein content. The per se performance indicated that the parent RD 2786 expressed maximum mean value for grain yield per plant. While the parent RD 2035 exhibited maximum mean values for number of spikelets per plant, number of effective tillers per plant, flag leaf area and parent BH 959 exhibited higher mean values for spike length and number of grains per spike. Parent RD 2715 and BH 959 depicted maximum mean values for protein content and parent RD 2035 expressed minimum mean values for days to 50 per cent heading. One cross RD 2786 × BH 959 depicted positive significant economic heterosis (8.82) for grain yield per plant over the best check BH 946 and also exhibited positive economic heterosis for flag leaf area, spike length, 1000-grain weight. The cross RD 2715 × BH 959 showed positive economic heterosis for flag leaf area, number of effective tillers per plant, number of spikelets per plant and protein content. Cross DWRB 91 × BH 959 showed positive economic heterosis for flag leaf area, number of grains per spike, number of spikelets per plant and protein content. Heterobeltiosis for grain yield per plant was exhibited by cross RD 2035 × DWRB 92 and maximum relative heterosis exhibited by the cross DWRB 91 × BH 959. Majority of the crosses exhibited significant negative relative heterosis for maturity characters and plant height indicated that for these characters the genes with negative effects were dominant. The analysis of variance for combining ability revealed that mean squares due to general combining ability (GCA) were and specific combining ability (SCA) effects were significant for all the traits, expect for days to 75 per cent maturity in case of sca effects. Crosses DWRB 91 × BH 959, RD 2552 × DWRB 64, RD 2035 × RD 2786, RD 2035 × BH 393, and DWRB 92 × BH 393 expressed higher positive significant sca effects ranged from 1.17 to 2.50 along with good per se performance from 14.44 to 21.07,Cross RD 2786 × BH 959 may be advanced to get transgressive segregates. Parents RD 2786, RD 2715, and BH 959 could be recommended for utilizing in varietal development.

**Keywords:** heterosis, transgressive segregates, heterobeltiosis, Randomized Block Design



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## OP-42

## SEED GERMINATION IN LUCERNE (MEDICAGO SATIVA L. CV EK SALI) UNDER DIFFERENT SALINITY (NACL) LEVELS

**Jahangirr Ahmad Magray**
Plant Physiology and Ecology Laboratory, Department of Botany
Government Model Science College, Gwalior- 474002
magray420@gmail.com

Soil salinity has created a severe threat, diminishing the quality and yield of Lucerne (Medicago sativa L.) worldwide including India. Seed germination is an important physiological aspect of plant-life. This study deals with seed germination under 0,10,20,50,100,200 & 500mM salinity levels of NaCl in Medicago sativa L. cv ek sali a popular cultivar grown in northern India including Punjab, Haryana, Rajasthan, U.P., M.P. and other parts of the country. Seed germination is supposed to be decreased under saline conditions. Highest seed germination (91±2%) was recorded under 100mM NaCl whereas 86±2% was observed in control. However, seed germination (82±2 &78±2%) was found to decrease under higher doses 200 & 500mM of NaCl. Early germination (24±2 hr) was observed in the control and maximum numbers of seeds were germinated in a span of 7 days whereas germination was delayed and recorded after 48±4hr after planting the seed and same was continued for an extended period of 10 days under the 500 mM dose. The highest radical length was found in control and the lowest radicle length was observed for 500mM NaCl treatment.

**Keywords:** Salinity, Lucerne, Seed germination, Radicle.

## OP-43

## SOME NEW DISTRIBUTIONAL RECORDS OF ENCYRTIDAE (HYMENOPTERA: CHALCIDOIDEA) FROM AGRO-CLIMATIC ZONES OF JHARKHAND, INDIA

**1Manendra Kaneria, 2Sudhir Singh**
1,2Forest Entomology Discipline, Forest Protection Division, Forest Research Institute, Dehradun
1kaneria.manendra@gmail.com

Present study is based on surveys done to assess the current status of encyrtid parasitoids in different agro-climatic zones of Jharkhand state during year 2018. Encyrtid parasitoids are very important in order to check the populations of other harmful insects which damage valuable agricultural and forestry crops. Therefore, they are efficient biological control agent and being used for controlling insect-pest infestation in crops. At present, more than 5,000 species of encyrtids belonging to 506 genera are known world-wide. In India, encyrtids are represented by nearly 750 species speared over 156 genera, which is about 15% of the species known from all over the world. Previous studies merely explored the status of encyrtids parasitoid in Jharkhand state. During the current study, 35

species belonging 24 genera are recorded for the first time from three agro-climatic zones of state. The material was collected using active and passive methods during field surveys. All species were identified using Nikon SMZ-U stereozoom microscope in the systematic laboratory and deposited in the National Forest Insect Collection of Forest Entomology Discipline, Forest Protection Division, Forest Research Institute, Dehradun.

**Keywords:** Encyrtid, species, biological control.

## OP-44
## ARBUSCULAR MYCORRHIZAL FUNGI INCREASE CERTAIN GROWTH AND PHYTOCHEMICAL PARAMETERS IN CHICKPEA PLANT (CICER ARIETINUM LINN.)

**Sameer Ahmad Thoker* and Sapan Patel**
School of Studies in Botany, Jiwaji University Gwalior M.P. India
sameerbotany@gmail.com

Arbuscular mycorrhiza fungi (AMF) colonize roots of host plants and promote plant growth due to improved uptake of nutrients. Arbuscular mycorrhizal fungi (Glomus hoi and Acaulospora kentinensis) promote growth of the economically important chickpea plant (Cicer arietinum Linn.) A pot experiment was conducted to evaluate the effect of arbuscular mycorrhizal fungi (Glomus hoi and Acaulospora kentinensis) inoculation on different growth and phytochemical parameters of chick pea (JG-62). The experiment was carried out at Botanical Garden of School of Studies in Botany, Jiwaji University Gwalior during Rabi season 2018-2019. The Plants were raised in triplicates through the pot culture. The seeds were surface sterilized by 4 % Sodium hypochlorite solution before sowing. Pots were placed at a sunny place after the seed sowing. And after the seed germination, plants were irrigated when required. After germination the inoculated plants along with their controls was sampled. We conclude that Glomus hoi and Acaulospora kentinensis shows better results in growth and development of chick pea when inoculated in combination. Our data suggest that inoculation of Glomus hoi and Acaulospora kentinensis significantly increases the biochemical constituents like chlorophyll-a, chlorophyll-b, total chlorophyll. Inoculation of Glomus hoi and Acaulospora kentinensis also increases the biochemical constituents viz total carbohydrate, reducing sugar, non reducing sugar, total protein and total phenol.

**Keywords:** AMF Inoculation, Glomus hoi, Acaulospora kentinensis, Growth and Development



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## OP-45
## ONION AS FUNCTIONAL FOOD IN HUMAN NUTRITION

**1Rafiq Lone, 2K.K.Koul, 1Azra N Kamili**
Center of Research for Development, University of Kashmir, J&K-India
School of Studies in Botany, Jiwaji University Gwalior, Madhya Prades-India
rafiqlone@gmail.com

The onion plant (Allium cepa) is an important vegetable crop of the world. The “onion” of the plant constitutes the underground bulb which is an underground modification of a stem with condensed shoot being covered by fleshy scales compactly. The roots originate superficially from the stem and not from the scales. The bulbs of onion plant are shown to present a higher level of metabolites like carbohydrates, protein and phenolics, and mineral nutrition in the mycorrhizal ones as compared to the non-inoculated ones. The HPLC analysis depicted that indigestible oligosaccharides are increased due to AMF inoculation. Phytochemical changes in the AMF infected plants in comparison to their respective controls by GC–MS analysis are also reported here in. Onions contain quercet in, a powerful flavonoid antioxidant. Onions are an excellent source of fibre, Vitamin C and folate. Phytochemicals found in onions, particularly allylsulfides, appear to reduce the risk of some cancers.

**Keywords:** Onion, AMF, Indigestible oligosaccharides, Quercetin

## OP-46
## IMPACT OF TRANSMISSION OF YELLOW LEAF VIRUS IN SACCHARUM OFFICINARUMLINN

**Keshav Shukla**
Department of Biotechnology, Invertis University, Bareilly, UP, India
keshavshukla1689@gmail.com

Sugarcane yellow leaf virus (ScYLV) is distributed worldwide and has been shown to be the cause of the disease sugarcane yellow leaf syndrome (YLS). This study was an investigation of the transmission and spread of ScYLV in Uttar Pradesh. Several aphids are known to transmit the virus, but investigation of infestation and transmission efficiency showed Melanaphissacchari to be the only vector important for field spread of the disease. The initial multiplication of in a virus-free plant occurred exclusively in very young sink tissues. When a single leaf was inoculated on a plant that leaf and all older leaves remained virus-free, based on tissue-blot immunoassay, and whereas meristems and all subsequently formed new leaves became infected. Therefore, only after those leaves which had already developed before inoculation had been shed, did the complete plant contain ScYLV. Spread of the viral infection to neighbouring plants in the plantation fields via aphids was relatively slow and in the range of a few metres per year. No indication of long-distance transfer could be seen. This indicates that it may

be possible to produce and use virus-free seed cane for planting of high-yielding but YLS-susceptible cultivars.

**Keywords:** Luteoviridae, Melanaphissacchari ,Saccharum officinarum, ScYLV, yellow leaf syndrome

## OP-47

## PROMOTING NOVEL AND PROMISING PLANT VARIETIES FOR ENHANCED AGRICULTURAL EFFICIENCY AND GLOBAL FOOD SECURITY

**Mushtaq Ahmad Khah**
Department of Botany, Shri JJT University, Jhunjhunu-333001 (Rajasthan)
mushtaq.khah@yahoo.com

The current and major challenge is to safeguard the global food safety and to feed the constantly increasing human population. Despite the dramatic increase in global food production, millions of people still suffer daily from under-nourishment as well as starvation. Protein deficiency is one of serious problem and threatens to become a real-nutritional disaster in the near future, primarily in India, where about 80% of the protein diet is supplied by plants. Because of the critical nutritional status of human population, there is an urgent need for development of cereal cultivars that would be more nutritious (with improved protein, zinc, iron etc. value), meeting our health demands. Novel and improved varieties of plants are an important and sustainable means of achieving food security in the context of population growth and climate change. New varieties that are adapted to the environment in which they are grown increase the choice of healthy, tasty and nutritious food while generating a viable income for farmers. Breeding plant varieties with improved yield, more efficient use of nutrients, resistance to plant pests and diseases, salt and drought tolerance and better adaptation to climatic stress can sustainably increase productivity and product quality in agriculture, horticulture and forestry, whilst minimizing the pressure on the natural environment. Innovation in agriculture and horticulture is important for economic development. Production of diverse, high quality varieties of fruit, vegetables, ornamentals and agricultural crops followed by their efficient marketing provides increased income for farmers and employment for millions of people around the world. New varieties can be the key to accessing global markets and improving international trade for developing countries. At the same time, new varieties can support the development of urban agriculture and the growing of ornamental plants, shrubs and trees that contribute to improving the lives of people in the expanding urban environment.

**Keywords:** Promotion, Novel, Plant varieties, Food security, Agricultural efficiency



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## OP-48

## ROLE OF TRANSCRIPTION FACTORS IN ORYZA SATIVA L. UNDER COLD STRESS

**Wasifa Noor, 1Azra N Kamili, 2Amjad M Husaini**
1Centre of Research for Development, University of Kashmir Hazratbal, Srinagar-J&K, India
2Division of plant biotechnology, Sher-e-Kashmir University of Agricultural Sciences and Technology of Kashmir
*wasifanoor3@gmail.com

Abiotic stresses such as high temperature or low temperature stress, drought and salinity affects the crops growing under field conditions. Abiotic stresses directly or in directly influence plant growth and development which in turn affect agricultural productivity and hence food security. Cold stress results in an impairment in the growth and development of rice (Oryza sativaL.) at an early seedling stage which thus results in decrease in crop yield. To circumvent the low temperature stress plants have developed several mechanisms such as desaturation of lipid fatty acids to increase the membrane fluidity, activation of antioxidant enzymes, for maintaining cell water status they start building up of osmolytes. To attain the tolerance to low temperature stress plants increase the expression of certain genes. The expression of these cold tolerant genes which impart tolerance improvement occurs by transcription factors. The transcription factors are induced due to accumulation of ROS, which are activated by cold stress. These transcription factors work via an ABA dependent or ABA independent pathway. Transcription factors belonging to MYB family play an important role during cold stress. MYB4 gene belonging to MYB family of transcription factors has been isolated from rice genome and has been shown to increase the tolerance to cold stress. AP37 is a rice AP2/ERF TF which increases the tolerance to cold, high salinity and drought. RAB16A is a group 2 LEA protein whose expression increases during various abiotic stress. It is an ABA-inducible and is highly expressed during cold, salinity and drought stress.

**Keywords:** Oryza sativa L., cold stress, AP37, MYB4

## OP-49

## ROLE OF ELICITORS IN INDUCING RESISTANCE IN PLANTS AGAINST PATHOGEN INFECTION

**Gousia Majeed1 and Azra Nahid Kamili1**
1Department of Environmental Science, Plant Tissue Culture Lab. Centre for Research and Development, University of Kashmir, 190006.
gousiafatima17@gmail.com

Different elicitors are reported to play crucial roles in plant defense responses by inducing the expression of defense related genes against insect damage and microbial pathogens attack. Plants

then recognize these elicitors and activate a complex signal transduction pathway that induces their defenses. Following elicitor perception, the activation of signal transduction pathways generally lead to the production of active oxygen species (AOS), ion fluxes, mitogen-activated protein kinase (MAPK) cascade activation, phytoalexin biosynthesis, reinforcement of plant cell wall associated with phenyl propanoid compounds, deposition of callose, synthesis of defense enzymes, and the accumulation of defense pathogenesis related proteins, some of which possess antimicrobial properties. AOS lead to hypersensitive response (HR) in plants which is a localized or rapid death of one or few cells at the infection site to delimit the pathogen growth. Following the activation of HR, uninfected distal parts of the plant may develop resistance to further infection by a phenomenon known as systemic acquired resistance which is effective against diverse pathogens, including viruses, bacteria, and fungi. Jasmonic acid (JA) and salicylic acid (SA) are most common plant elicitors considering disease management. Jasmonic acid is reported to increase disease resistance in plants to a variety of pests, while salicylic acid is recognized as a potential regulatory compound of different pathogens. Jasmonic acid levels rise steeply in response to insect herbivore damage and trigger the production of many proteins involved in plant defenses. Also, Jasmonic acid is known to induce the transcription of a host of genes involved in defensive metabolism, among the genes it induces are those that encode key enzymes in all the major pathways for secondary metabolite synthesis. Secondary metabolites are plant compounds that also defends plants against a variety of herbivores and pathogenic microbes. These defence responses are essential for the success of plant resistance therefore contribute to plant immunity. Ultimately, elicitor perception will also increase the level of plant resistance against future pathogen attack.

**Keywords:** Secondary metabolites, pathogenic microbes, Jasmonic acid, MAPK

## OP-50

## PRAGMATIC APPROACH FOR PLANT DISEASE MANAGEMENT IN THE SHADES OF GREEN: THE GENUS TRICHODERMA IN ACTION

**Ashish Kumar1 and R. Shiv Ramakrishnan2**
1Scientist, Plant Pathology, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, M.P., India
2Scientist, Plant Physiolog, Jawaharlal Nehru Krishi Vishwa Vidyalaya, Jabalpur, M.P., India

During last decade, species of Trichoderma have been identified as most powerful arsenal of bioprotectants for eco-friendly management of a wide variety of plant diseases. This is more accurate in the background of the fact that there is great social and environmental scientist's pressure to reduce emphasis on chemical protectants and increase the use of bioprotectants. The genus Trichoderma by virtue of its broad spectrum action against a number of plant diseases caused by fungi, bacteria and even nematodes, has occupied the top position among the bioprotectants developed for plant disease management. In the present investigation, 14 districts of Madhya Pradesh were surveyed resulting in 177 soil samples representing 62 blocks of 14 districts of Madhya Pradesh. Out of 177 soil samples 40 samples yielded Trichoderma isolates from rhizospheric region of plant from cultivated field or from non-cultivated field. The cultural characteristics of the isolates were significantly variable from each



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other but cover full petriplate growth of 85 mm with in 3rd day of incubation at 25°C. Predominantly effuse conidiation with different shades in colony colour including light green, dark green-white, light green-white, yellow green and white with aerial, sub-aerial and submerged-aerial type of growth pattern was observed. The isolates also showed host selectivity in their capacity to inhibit the different plant pathogens. It was observed that Trichoderma isolate T21 showed its maximum inhibition capacity against two plant pathogenic fungi namely U. segatum var. segatum and R. bataticola; and Trichoderma isolate T6 showed its maximum inhibition capacity against a group of three plant pathogenic fungi namely Sorosporium paspali thunbergii, Helminthosporium graminea and Alternaria solani. This suggests that different isolates of Trichoderma have their differential rate of inhibition against different plant pathogenic fungi. Apart from the direct inhibition of plant pathogens by mycoparasitism on hyphae of the different plant pathogenic fungi, a set of eight isolates effectively parasitized the 100 % sclerotia of S. rolfsii. Selected isolates were used in field conditions as seed treatment and foliar spray and showed significant effect not only in plant growth promotion in chilli and cauliflower but also in chilli fruit rot and cauliflower leaf blight management. To identify the genes responsible for secondary metabolite production in Trichoderma which are obvious component of antibiosis, a cluster of Glutathione S-transferase (GST) gene has been identified. The GST gene sequence was extracted from the Mycocosm (http.//genome.jgi.doe.gov.mycocosm). The ORF, coding for a protein of 198 amino acids was interrupted by four introns of 81bp, 69bp, 63bp and 56bp respectively. The sequence was analysed for homology with other fungal Glutathione S-transferase by BLASTP (protein-protein query) on the NCBI site and the nearest homologues obtained (Phylogeny tree). The T. virens Glutathione S-transferase was highly homologous with members from other filamentous fungi, indicating the well-conserved nature of this protein. Further, its role was identified in secondary metabolite production. The low cost technology has opened up a new vista for plant disease management and is likely to be a boon for seed industries willing to provide protection to seeds as well as plants against a large number of seed, soil- borne and foliar diseases.

**Keywords:** BLAST, Trichoderma, Alternaria solani, Madhya Pradesh, Glutathione S-transferase

## OP-51

## CHEMICAL DESIGNING OF SMART NANOCOMPOSITES TOWARD EFFICIENT ENVIRONMENTAL REMEDIATION

**Nimisha Jadon and Vipin Jain***
School of Studies in Environmental Chemistry, Jiwaji University, Gwalior-474011(India)
vipin2012jain@gmail.com

Environmental nanotechnology is considered to play a key role in shaping current environmental engineering and science. Looking at the nanoscale has stimulated the development and use of novel and cost-effective technologies for catalytic degradation, adsorptive removal and detection of contaminants as well as other environmental concerns. The interest in the synthesis of inorganic–organic nanocomposites has grown rapidly due to their wide range of applications. The commonly used

nanoparticles for environmental remediation are biopolymers, single enzyme nanoparticles (SENs), zero valent metals, and metallic oxides. Metallic nanoparticles (NPs) of iron groups such as Co, Cu, Fe, and Ni are of interest to many scientists due to their magnetic and chemical catalytic properties, which are small with a highly specific surface area. Hence, these kinds of NPs and their composites with silica, polymer, carbon, and noble metals are appropriate for environmental remediation applications. Nanomaterials present enhanced reactivity and thus better effectiveness when compared to their bulkier counterparts due to their higher surface-to volume ratio. In addition, nanomaterials offer the potential to leverage unique surface chemistry as compared to traditional approaches, such that they can be functionalized or grafted with functional groups that can target specific molecules of interest (pollutants) for efficient remediation. Further, the intentional tuning of the physical properties of the nanomaterials (such as size, morphology, porosity, and chemical composition) can confer additional advantageous characteristics that directly affect the performance of the material for contaminant remediation and the rich surface modification chemistry along with the tunable physical parameters of the nanomaterial offer significant advantages over conventional methods for addressing environmental contamination.

**Keywords:** Smart nanocomposies, Environmental remediation, Contaminants, nanoadsorption

## OP-52

## COST ESTIMATION OF HERBAL MILK USING TULSI, GINGER AND TURMERIC

**Gaurav Kumar Gaur1, Rekha Rani2*, Bhopal Singh3, Khushal Solanki1, Chetan Dharaiya4**
1,2 Dairy Technology, Warner College of Dairy Technology, SHUATS, Prayagraj (UP), India
3Dairy Technology, Dayalbagh Educational Institute, Agra (UP), India
4 Dairy Technology, SMC College of Dairy Science, AAU, Anand (GJ), India
*Corresponding author: rekha.rani@shiats.edu.in

The present study is aimed at estimation of production cost for herbal milk prepared by addition of tulsi juice (25%), ginger juice (3%) and turmeric powder (0.1%) in milk followed by sterilization. Herbal milk improves human health, reduces health care cost and supports economic development. The interest in herbal products has been increasing as people look at it as a safer way to improve general health and living. Also, herbal extracts in all their forms represent arguably the greatest potential for food formulators in today's quest for ever more innovative new functional food products. The chemical composition of the optimized product was: fat 3.59%, total solids 14.96%, protein 3.01%, ash 0.70%, carbohydrates 9.30% and it contained 81.55 Kcal energy. The antioxidant and total phenolic content were 50.14% DPPH activity and 96.25 mg GAE/100gm respectively. Due to good amount of antioxidant and total phenolic content, it can give various health benefits such as anti-microbial, anti inflammatory, cardio protective, anti carcinogenic, anti pyretic. The price of herbal milk was worked out at ₹ 14.17 for 200 ml (serving size), which is proximately similar to the control milk sample which is ₹14.55 per 200 ml. Thus, it can be concluded that the herbal milk developed in this experiment using novel natural flavor is similar to the varieties available in the market. Hence, launching of herbal milk in the market can fetch good market to the milk manufacturers at the same time enable the consumers to enjoy a new delectable completely natural flavor.

**Keywords:** Tulsi, Turmeric, Ginger, Herbal milk, Functional food, Cost analysis

## OP-53

## AN ECO-FRIENDLY MANAGEMENT OF AN ORGANIC WASTE IN GANDHI ZOOLOGICAL PARK: A CASE STUDY FOR REVENUE GENERATION

**Rouf Ahmad Mir1, Pragiya Singh Pawaiya2, Sarita Shrivastava3, O.P Agrawal**
Department of Zoology, Govt. Model Science College, Gwalior 474011, M.P
Corresponding author: roufbio24@gmail.com

Prior to the start of vermicomposting units (2013-2014), the huge volume of organic waste engender in the zoo was sold to the public at rate of Rs 500 per truck amount Rs 9500 per year. However, large profusion of waste were customarily left within the zoo premises conveyance an uncouth and unhygienic condition in the zoo. The zoo organic wastes include dung of different animals, vegetables, leaves and papers etc. that are generated in Gwalior zoo every day. The highly nutritive organic waste if remain as such around animals, it decomposes and spread number of diseases among protected animals and pollution occurs which creates hurddle for visitors and authorities. To enhance zoo economy, make it more attractive and keep zoo premises clean, a vermicomposting plant is set up in 2017 to generate annually revenue 60000, in future it will be increased because farmers prefer the vermicompost of the zoo, as its quality is good and price is also cheaper. A study was conducted of management and economic implications of wastes generated at zoo level. The most dung producing animals in Gwalior zoo are Hippopotamus, Nil Gay, Barasingha, number of Deer species and droppings of Birds etc. were transported to the vermicomposting unit. On an average 200 kg of wastes is produced every day in the zoo (MCG, 2017). Considerable quantities of fallen leaves, grasses and other green materials from the garden section are also used. Due to worm bio-technology, organic wastes will be converted into biofertilizers (vermicompost) which is bio-safety product and maintain ecological balance in the ecosystem.

**Keywords:** Unhygienic, Pollution, Protected animals, Biofertilizers, Worm bio-technology, Ecosystem. Economy.

## OP-54

## HEALTH EFFECTS OF PM2.5 ON THE POPULATION OF INDIAN CITIES

**Gourav Kumar Singh, Swapnil Rai, Nimisha Jadon**
Department of Environment Science, Amity University, Maharajpura, Gwalior-474005 (Madhya Pradesh), India

Particulate matter (PM) is one among the crucial air pollutants and has the potential to cause a wide range of health effects. Indian cities ranked top places in the World Health Organization list of most polluted cities by PM. Increasing concentration of air pollution and its adverse effects on health is rapidly increasing in India and other cities of India. Different cities of India have drawn the attention of government and researchers in recent years. This study is designed to analyze the spatial and temporal variations of particulate matter (PM2.5) concentrations in some cities like Gwalior, Bhopal. The daily PM2.5 concentrations monitored by the Central Pollution Control Board (CPCB), during winter and summer season in different locations distributed in the region of the study were used for the analysis. The descriptive analysis indicates that the spatial mean of monthly average PM2.5 concentrations. The maximum and minimum spatial variance observed in the months of March and September, respectively. The study also analyzed the PM2.5 Air Quality Index (AQI) for assessing the health impacts in the study area. Annual PM Concentration in most of the cities is higher than the National Ambient Air Quality Standards of India. The AQI value was determined according to the U.S. Environmental Protection Agency (EPA) system. The result suggests that most of the area had the moderate to very unhealthy category of PM2.5-AQI and that leads to severe breathing discomfort for people residing in the area. It was observed that the air quality level was worst during winter months (October to January). Because of the increasing level of pollutants in the atmosphere, the health status of the residents is also degrading. Trend analysis showed peak PM concentration during post-monsoon and winter seasons. The respiratory and cardiovascular hospital admissions in the male (female) population are estimated to be 31,307 (28,009) and 5460 (4882) cases, respectively. PM2.5 has accounted for a total of 1,27,014 deaths in 2017. Cities with high PM concentration and exposed population are more susceptible to mortality and hospital admissions.

**Keywords:** Particulate matter (PM2.5), inverse distance weight, AQI mapping, health effect, EPA.

## OP-55
## SCIENTIFIC RESEARCH IN ANTARCTICA

**Pawan Kumar Bharti**
Antarctica Laboratory, R & D Division,
Shriram Institute for Industrial Research, 19, University Road, Delhi-110 007, India
*E-mail: gurupawanbharti@gmail.com

Environmental monitoring and impact assessment studies are very important to evaluate the negative impact of anthropogenic activities on various environmental components. Human interference and settlements is the emerging issue in various part of south pole including east Antarctica. Many environmental studies were carried out and a few are in the progress in Vestfold Hills, Larsemann Hills and Schirmacher Oasis in East Antarctica. Long term environmental studies were carried out in east Antarctica during the austral summer seasons of various Indian Scientific Expeditions to Antarctica (26th ISEA to 30th ISEA) by SIIR at Larsemann Hills and Schirmacher Oasis for Ambient Air Quality, Freshwater Quality, Marine Water Quality, Soil & Sediment Quality, Noise level Monitoring, Solid waste



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generation, Biodiversity assessment, etc. A comprehensive work was carried out before and during the construction of Bharti Station, hence the detailed study after commissioning of Bharti Station is equally important and must be carried out to evaluate the impacts on various environmental components.

**Keywords:** Antarctic Environment, environmental monitoring, Impact assessment, environmental components, Larsemann Hills.

## OP-56
## ENDOPHYTES: A CONCEALED TREASURE OF NOVEL METABOLITES

**Sabba Yaqoob1, Azra N. Kamili1 and B.A. Ganai1**
1Centre of Research for Development and Department of Environmental Science,
University of Kashmir, Srinagar, 190006 (Jammu & Kashmir), India.

Endophytes are the plant-associated microorganisms that colonize within the healthy tissues of their host plants without causing any apparent disease. Endophytes are ubiquitous, found in every studied plant. They grow intercellular or intracellular, at least for a portion of their lives, within the plant. Almost all assemblies of microorganisms have been found in endophytic association with plants may it be fungi, bacteria or actinomycetes. Endophytes usually have increased metabolic activity than their non-endophytic counterparts. They produce remarkably high numbers of secondary metabolites, which are often bioactive and of low molecular weight. Some of the endophytic microorganisms can produce the same secondary metabolites as that of the plant by imitating their chemistry thus making them a promising source of valuable compounds that can be exploited for human health and welfare. They stimulate the production of secondary metabolites with a diverse range of biological activities. The choice of the plant to be used for discovering endophytes for novel bioactive metabolites is important. Therefore, medicinal plants which are known to be used since times immemorial as an alternative source of medicine are a precious source for bioprospecting endophytes.

**Keywords:** Endophytes, Secondary metabolites, Medicinal Plants.

## OP-57
## CYTOKININ INDUCED STAYGREEN POTENTIAL IN CONTRASTING SET OF DROUGHT TOLERANT WHEAT GENOTYPES IN RESPONSE TO DROUGHT STRESS IS DETERMINED BY PHOTO-BIOCHEMICAL PROCESS AND ANTIOXIDATIVE RESPONSES.

**R. Shiv Ramakrishnan1, Ashish Kumar1, Shivani Nagar2 and Ajay Arora2**
1College of Agriculture, Jawaharlal Nehru Krishi Vishwa Vidhalya, Jabalpur (M.P.) 482004

2Division of Plant Physiology, IARI, New Delhi-110012
Corrosponding author email: shivram.krishnan2008@gmail.com

Drought as a consequence of climate change is a principal factor limiting the productivity of wheat worldwide. Out of the total geographical area of India, one sixth area is drought prone and the major wheat growing states such as Gujarat, Rajasthan, Uttar Pradesh and Madhya Pradesh had more probability of occurrence of drought once in a three year. In wheat crop, yield loss take place due to drought either during the vegetative phase or reproductive development or at the end of the crop cycle as a terminal drought. Water deficit leads to severe physiological and biochemical limitations on plant growth and productivity. During water deficit stress, a series of hormonal alteration such as a decrease in cytokinins (CKs) or an uplift in ABA leading to inhibition of photosynthesis and decrease in crop yield. Mining the previous works, it was hypothesized that cytokinin might play a prominent role in inducing staygreen trait by delaying senescence consequently leading to impart drought tolerance. In order to justifying our hypothesis, the present investigation was conducted to study cytokinins (CKs) induced staygreen (SG) trait and its association with drought tolerance in wheat in which thirty five wheat germplasm from India and CIMMYT were phenotyped for staygreen trait such as leaf senescence rate (LSR) and SPAD chlorophyll meter reading (SCMR), physiological traits such as RWC, DSI, grain yield and yield attributing traits such as 1000 kernel weight, plant biomass and ear weight per plant. Evaluation of germplasm using multivariate analysis viz. Ward's method of hierarchical clusters analysis categorized germplasm into six group. CHIRYA7 and HW2041 were selected as functional staygreen germplasm (FSG) with low LSR and DSI and in contrast HW2033 and CBW38 were selected as non-staygreen germplasm (NSG) with high LSR and DSI for further validation of staygreen providing the drought tolerance in these contrasting set of wheat germplasm. SG germplasm retain more trans-zeatin (bioactive cytokinin) as compared to NSG germplasm under drought over control. This reveals positive association of cytokinin and SG trait under water deficit stress terms of maintaining higher chlorophyll content, photosynthesis rate, photochemical efficiency, stomatal conductance, transpiration rate, RWC and MSI. SG germplasm shows competency to quench reactive oxygen species (ROS) due to enhanced activities of enzymatic antioxidant particularly CAT, POX, SOD, APOX and GR and non- enzymic antioxidant such as ascorbic acid. This reflects cytokinin inducible upregulation of ROS scavenging enzymes, ascorbic acid accumulation and its association with staygreen trait under water deficit stress condition in wheat. Further, comparative expression analysis between SG and NSG wheat germplasm were dissected to understand the novel genetic regulatory mechanism associating CKs production with the downstream events imparting staygreen trait induced drought tolerance mechanism. Staygreen character of FSG (CHIRYA7 and HW2041) was attributable to the highest expression of rate limiting cytokinin biosynthetic gene TaIPT2 along with lowest expression of (TaCKX2, TaCKX7, TaCKX8, TaCKX10 and TaCKX11) under water deficit stress condition, which further validated the positive association of cytokinin with staygreen trait induced drought tolerance mechanism at transcriptome level. The identified staygreen genes/germplasm have the potential to be used in molecular breeding/genetic engineering programme for the development of drought tolerant wheat.

**Keywords:** transcriptome, transpiration rate, cytokinin, ABA, drought tolerant, wheat genotypes.



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## OP-58

## NON-DESTRUCTIVE AND LABEL FREE EVALUATION OF BIOCHEMICAL SPECTRAL SIGNATURES OF THE BITTER GOURD BY ATR FTIR & FT-RAMAN SPECTROSCOPY

**Nidhi Shukla1 and K. N. Uttam2**
1Amity University Madhya Pradesh, Gwalior
2 Saha's Spectroscopy Laboratory, Department of Physics, University of Allahabad, Allahabad
Email: nidthesaviour@gmail.com

Bitter gourd scientifically known as Momordica charantia, is a popular fruit used for the treatment of diabetes, cardiovascular diseases, abortifacient, anthelmintic, contraceptive, dysmenorrheal, eczema, emmenagogue, antimalarial, galactagogue, gout, jaundice, abdominal pain, kidney (stone), laxative, leprosy, leucorrhea, piles, pneumonia, psoriasis, purgative, rheumatism, fever and scabies etc. its regular intake act as a shield and prevent many complications like, hypertension, eye complications, neuritis, defective metabolism of carbohydrate, body resistant against infection. Therefore, author focused the attention on this plant. It is often used as a vegetable in diet.

Raman and ATR FTIR spectroscopy is a non-destructive, label free, rapid, and sensitive and extraction free versatile technique for detecting vibrations arising from the biomolecules. The excitation of the biosamples with the visible light source in Raman regime interferes with the samples photochemically and emits fluorescence that conceals Raman signal in the plants tissues while infrared excitation source reduces the fluorescence signal together with the water signal. Therefore FT-Raman and ATR FTIR spectroscopy has been used for the investigation of the biochemical composition and their concentration variation within the different layer of the Bitter gourd spectroscopy.

The FT-Raman and ATR-FTIR spectra of the different parts of the Bitter gourd fruit have been recorded in the spectral region of 485-4000 cm-1 at a resolution of 4 cm-1. The recorded spectrum depicts spectral signatures of the different biochemical: carotenoid (β-carotene), polysaccharides (cellulose, starch and pectin), sugars (glucose, fructose), proteins, lipids, unsaturated fatty acids, and amino acids. The curve fitting analyses have been used for the quantitative analysis of various biochemicals and their distribution. The study demonstrates that the FT- Raman and ATR- FTIR spectroscopy techniques are rapid sensitive, accurate and non-destructive tools for the analysis of the intact fresh plant tissues without the necessity of sample preparation.

**Keywords:** ATR-FTIR, Momordica charantia, cardiovascular diseases, vegetable.

## OP-59

# APPLICATION OF EDIBLE COATING FOR MINIMALLY PROCESSED FRUITS AND VEGETABLES

**Harshad M Mandge1, Rahul Kumar Verma1 and Deepika Goswami2**
1Banda University of Agriculture and Technology, Banda (Uttar Pradesh)-210001
2Central Institute of Postharvest Engineering and Technology, Ludhiana-141004

Minimally processed fruits and vegetables steadily becoming one of the major growth segments in the food retail industry. Fresh cut fruits or minimally processed fruits and vegetables are having added convenience value, apart from providing major role in nutritional security. However, supply chain for minimally processed fruits and vegetables demands new strategies to increase their storability and extend shelf life. The application of edible coatings has potential considered to be an innovative approach to enhance quality and extending shelf life of fresh and minimally processed fruits and vegetables by regulating the transfer of moisture, oxygen, carbon dioxide, aroma, and taste compounds. Edible coatings are an environmentally friendly technology that can function as barriers to water vapor, gases, and other solutes. Components used for the preparation of edible films can be classified into three categories: hydrocolloids (such as proteins, polysaccharides, and alginate), lipids (such as fatty acids, acylglycerol, waxes) and composites. Edible coatings have also been utilized as carriers for a variety of food additives. Furthermore, they can be used to contribute to the production of volatile aromas. The combination of coating materials with antimicrobials is shown as a possibility to enhance the safety of ready- to-eat fresh produce. Minimally processed fruit and vegetables are usually coated by dipping or spraying, which forms a thin film on the food surface that acts as a semi-permeable membrane.

**Keywords:** fruits and vegetables, environmentally friendly, proteins, polysaccharides, lipids

# POSTER PRESENTATION

## ABSTRACTS

## PP-01

## ERUDITION OF SOME COMMON DISEASES AND RESOLVE SPIKE TO RECOGNIZE AND OVERCOME IT

**Sakshi Sherewar1 Janvi Satpute2**
Sau. Vasudhatai Deshmukh College of Food Technology, Amravati.
sakshi17bang@gmail.com

A disease is a particular abnormal condition that adversely affect the functioning of body organs, but not because of the external injury they are offend known to be medical conditions that are associated with specific symptoms and signs. Mainly disease are classified into two types communicable disease and non communicable disease but widely it is classified in to four types ,infectious diseases, deficiency disease ,hereditary disease and physical disease. Some concept of disease is also explained as acquire disease, acute disease, chronic disease, congenital disease, genetic disease, herediatery or inherediatery disease, latrogenic disease, incurable disease, primary disease, secondary disease, and so on. Here is integration of communicable disease and non-communicable disease with there symptoms to identify them as soon as. “Non-communicable disease”: The disease which is not transmissible directly from diseased person to normal person. Non-communicable disease is shortly known or can called as NCD .These disease are autoimmune disease. Stroke, most heart disease, most cancers, two types of diabetes, chronic kidney diseases, there are some non-communicable infectious diseases like parasitic diseases. Risk factors for non-communicable disease are persons background, lifestyle, and environment. The risk factor which includes the non-communicable disease are age, gender, genetics, exposure to pollute air, unhealthy diet, smoking and other physical inactivity that can lead to obesity and hypertension. There are also some environmental factors by which non-communicable diseases occurs like sunlight, nutrition choice, and other lifestyle habits .It cause diseases like cardiovascular diseases, lower back pain this cause due to lack of exercise in our daily routine. By the radiation of sun skin cancer and due to bad lifestyle obesity is increasing day by day in population. Inherited disease like down syndrome, cystic fibrosis, heterochromia. The major reason of causing non-communicable disease include tobacco, smoking, alcohol, poor diets, that is high consumption of sugar and salt saturated fats and physical inactivity. “Communicable disease”: Disease which are spread by infection causing agent are called as communicable diseases. There are various infectious agent such as bacteria, viruses, fungi or parasites. Communicable disease also spread through air, It occurs due to direct contact with a contaminated surface, food or beverages, blood or other body fluid sometimes infection by infected animals or insect is also capable of spreading the diseases. Caution, avoid sharing personal objects, get vaccinated cover your cough and sneeze with a tissue. Clean and disinfect disinfect frequently touched surface to kill germs, Washing hands e.t.c. Signs and symptoms of communicable disease, mild infection can may cures by resting and home remedies ,while some life threatening infections may need hospitalization. Every disease have its own symptoms but commonly occurring symptoms are; fever, diarrhea, fatigue, muscle aches, coughing. The above symptoms are lighter they can cure at home also but when bitten by any animal having trouble in breathing ,experience arash, swelling, sudden vision problem then we have to see doctor .so identification of disease is primary and important step. From them we can overcome by some home remedies.

**Keywords:** Disease, non-communicable disease, communicable disease, causing agents.





## PP-02

## SYNTHETIC FOOD COLOURS AND ITS IMPACT ON AQUATIC ECOSYSTEMS

**Divya Upadhyay, Ashutosh Tripathi, Tanu Jindal, K. D. Joshi# and Kartikeya Shukla**
Amity Institute of Environmental Science, Amity University, Uttar Pradesh, Noida
#ICAR-National Bureau of Fish Genetic Resources, Lucknow
kshukla1@amity.edu

Synthetic food colours are manufactured and pzrocessed chemically, by coal tar and now-a-days from petroleum, that can be harmful to humans. Synthetic food colours are of two type, dye and lake that are in accordance with the international food quality standards. These are active ingredient of various food products like custard, cereal, ice cream, beverages and confectionery items which are water soluble and exhibit colouring effect when dissolved. Our food colours have high utilitarian value & vastly used dyes in food, pharmaceutical, cosmetic & various other industries, and are certified “D&C” Colors meaning they can be used in Drugs and Cosmetics, but not as food colouring agents. Lake colours are oil soluble and can be mixed in vegetable oils, fats, other cosmetic oils etc. and are Certified “FD&C” Colours - can generally be used in Foods, Drugs and Cosmetics. Synthetic food colours are used both in commercial food production and in domestic cooking. Synthetic food colour imparts attraction to the food but its use has become an environmental hazard as is toxic in nature and has got several harmful effects on humans also. The main sources with severe polluting problem worldwide are, industries and its waste water containing synthetic food colour. It is recognized as one of the root cause of ecosystem pollution. High concentrations of wastes from synthetic food colour manufacturing units into water bodies stop the re-oxygenation capacity of the receiving water and block sunlight, thereby upsetting biological activity in aquatic life and also the photosynthesis process of aquatic plants. The polluting effects of these in aquatic environment may result to toxic effects due to their long time presence in ecosystem, accumulation in sediments especially in aquatic life forms or in fishes, decomposition of pollutants into carcinogenic or mutagenic compounds and also low aerobic biodegradability leading to water pollution. This makes the removal of synthetic colour from wastewater as more important than the removal of the soluble colourless organic substances. Residents and farmers near rivers which have been turned colored because of waste discharge from industries have reported health problems and danger to aquatic life and lifeless river turning to sludge. They wonder if the food they are obliged to grow in nearby fields is safe to eat? The food colour process discharges many chemicals through the polluted water and chemicals, which results in the death of aquatic life, the ruining of soils and poisoning of drinking water. Synthetic food Dyes are used in a wide range of industries. Environmental problems arise mainly from inefficient removal of synthetic food colours or disposing the untreated food colours effluent to water receiving bodies. Discharges of these highly coloured effluents can damage directly the receiving waters with serious impact on environment and human health. The polluted water from the wastes of food colouring units may disrupt the trophic structure of aquatic life triggering ecological succession.

**Keywords:** Food colorant, Ecosystem, Toxic, Carcinogenic, Effluents

## PP-03
## A REVIEW ON RAIN WATER HARVESTING

**Namita Saxena**
Department of Chemistry, RJIT BSF Academy Tekanpur, Gwalior MP- 474005
nam_saxena26@yahoo.com

Rain water harvesting is one of the most effective method of water conservation and water management. It is a simple process or technology used to conserve rain water by collecting, storing, conveying and purifying of rain water that run offs from rooftop, parks, roads open ground etc. for later use. Capturing the rain water help recharge local aquifers, reduce urban flooding and most importantly ensure water availability in water scarce zone. Rain water harvesting is a sustainable way of water conservation; such water can be used throughout the year for all basic needs. India is practicing rain water harvesting since 10th century. In 11th century largest rain water harvesting was done by Chola King. Now Government of India has decided to make rain water harvesting (RWH) compulsory in urban areas, considering increasing population and burden on water supply. In this review article, the need, process of RHW, it's component, methods, advantages and disadvantages will be discussed.

**Keywords:** Rain water harvesting, Runoff, Catchment area, Surface water, Rooftop

## PP-04
## ASSESSMENT OF PHYSICOCHEMICAL AND BIOCHEMICAL PARAMETERS IN MANGO AND TOMATO JUICE

**Madhu Parmar, Hradesh Rajput, J.L. Bhat, Sonia Johri**
Department of Life Science, ITM University Gwalior

Mango can be considered a "natural functional food", whose regular consumption can prevent several chronic diseases, including cardiovascular diseases and some types of cancer. Mango is a rich source of many phytochemical compounds, which also impart a color and flavor to the fruit. The phytochemical compounds of mango are mainly phenolic compounds and these compounds can be obtained from various parts of the plant such as fruit, kernel (stone), leaves, and bark. Tomato is a wonder fruit fortified with health-promoting phytochemicals that are beneficial in preventing important chronic degenerative disorders. Tomato is a good source of phenolic compounds (phenolic acids and flavonoids) carotenoids (lycopene, α, and β carotene), vitamins (ascorbic acid and vitamin A) and glycoalkaloids (tomatine). Bioactive constituents present in tomato have antioxidant,) anti-mtagenic, anti-proliferative, anti-inflammatory and anti-atherogenic activities. Health promoting bioactivities of tomatoes make them useful ingredient for the development of functional foods. The study deal with



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the formulation of product with added probiotics to enhance the nutritional values and improve the overall health status. Preliminary study deals with the sensory evalutions of various combinations of mango and tomato followed by proximate analysis and analysing biochemical variables. The prepared mango pulp and tomato juice were analysed for a moisture, ash, carbohydrates, protein and phenolics. The analysis showed that mango pulp contained 84% moisture 0.56% ash, 29mg/100 vitamin C, 15.3% TSS. The tomato juice contained 88% moisture, 0.44% ash, 4.6 % TSS .The moisture and ash content of the combinations was 92% and 0.38% respectively. Thus in the initial stage of the study it can be prospected that nutritional aspect of mixed prepared product of mango and tomato can be considered at a definite percentage for a probiotication.

**Keywords:** Fruit Juice, Tomato, Mango, Proximate analysis.

## PP-05
## WATER SCARCITY: KEY ISSUE IN CURRENT SCENARIO

**Ayushi Chavan, Meghamani Arya and Shivika Rathore**
Govt. Kamla Raja Girl's P.G. (Autonomous) College, Gwalior (M.P.)

Water scarcity is the lack of fresh water resources to meet demand, caused due to both natural and human made causes (like poor management of the resources, lack of government attention). 18% of world's population which resides in India has access to 4% of usable water sources and about 163 million Indian lacking access to safe drinking water. Government schemes like Atal Bhujal Yojana which provide benefits to the farmers to ensure adequate water strategy for farmer to benefit seven states (Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pardesh) to bring community level ground water management The central government has allocated Rs 6000 crore for these scheme. There are some impacts of water scarcity is population known in Banglore and Hyderabad water crisis caused due to rapid development and industrial boom, increased population, depleting ground water level. Later water crisis is the water scarcity in Chennai. On 19 June 2019, Chennai city officials declared that Day Zero, when almost no water is left, the four main reservoir supply is almost dry. Two years of deficient monsoon rainfall, particularly in late 2017 and throughout much of 2018 had led to this crisis. There are some solutions to overcome these crisis are to create Indian River Inter Links (linking Indian rivers by a network of reservoir and canals) to enhance irrigation and groundwater recharge. Reduce persistent floods and water shortages. NITI AAYOG (National Institution for Transforming India). Proposed to achieve sustainable development goals with cooperative federalism and released report on composite water management India in June 2018 listed Delhi and the 21 cities in India, which would run out groundwater by 2020. Other methods include Rainwater Harvesting, Rain Awareness, Farm Ponds production, utilization of ground water.

**Keyword:** Water crisis, NITI Aayog, Indian river interlinks, day zero.

## PP-06

## ARBUSCULAR MYCORRHIZAL FUNGI IN RHIZOSPHERE: AN ADVANTAGEOUS RELATIONSHIP

**Kajal S. Rathore, Reshu Gupta, Rashmi Barethiya and Shivom Singh***
*Department of Environmental Science, ITM University, Gwalior
Department of Biotechnology, KRG (Autonomous) Govt. PG College, Gwalior
Corresponding Author: drkajals101@gmail.com

In current scenario where an increase in crop production is significant to complete the current and future demand of food, agriculture systems should be sustained by maintaining soil structure and fertility. But, due to intensive farming, over use of chemical fertilizers, industrialization and urbanization many soils have become nutrient deficient, environmentally damaged and expensive in terms of lost agricultural production. The colonization of plant roots by arbuscular mycorrhizal fungi (AMF) can deeply affect the plant uptake of mineral nutrients and also protect plants from harmful elements present in soil. Amongst, the key players, AMF are one of the important organisms and have been marketed as an significant biological component to the agriculture. Varied responses of arbuscular mycorrhizal fungi (AMF) to these aspects are well documented, however, an understanding of the impacts of agronomic practices upon communities of these fungi would help to ensure an opportunity for the utilization of the symbiosis and contribute to the success of sustainable agriculture. In order to gain the optimum benefit from these fungi, care should be taken to use the appropriate management strategies to encourage their survival. The presented review considers biofertilizers within the framework of fertilizer demand and use of AM fungal inocula in organic farming.

**Keywords:** AMF, environment, potential, soil fertility, organic farming

## PP-07

## IMPACT OF CLIMATE CHANGE ON FOOD SECURITY

**Ummer John Ganai**
Department of Economics, JS University, Shikohabad (U.P)
ummerganai@gmail.com

Food safety exists when all community at all times have physical or economic access to adequate safe and nutritious food to meet their dietary needs. The evidence of human-induced climate change goes beyond observed increases in average surface temperatures; it includes melting ice in the Arctic, melting glaciers around the world, increasing ocean temperatures, rising sea levels, acidification of the oceans due to excess carbon dioxide, changing precipitation patterns, and changing patterns of ecosystem and wildlife functions. Climate change is possibly the most significant environmental challenge of our time and poses serious threats to sustainable development in the world and more so in most developing nations. Impact of climate change affects ecosystems, water resources, food and health. That food has to be affordable, safe and healthy, culturally acceptable, meeting specific dietary needs of the people and is obtained in a dignified manner, produced in ways that are environmentally sound and socially just. Climatic factors like precipitation, evaporation, humidity and sunshine duration form the basis for improvement of food security. There is need for policy makers, communities and aid providers to incorporate evidence based technologies in food systems and knowledge. There are many causes of global food insecurity and most of them are region specific, except climate change where impacts are felt globally. Some are human causes like destruction of fertile lands and others are non-human like natural disasters. Other important practices for addressing food insecurity include changing consumption patterns and food preparation practices, efficient water use, improving soil quality, capacity to withstand extreme events and carbon sequestration. This paper will address all these issues with the help of case studies and relevant literature.

**Keywords:** food consumption, livelihood, climate, changes

## PP-08

## ANTAGONISTIC ACTIVITY OF PECTINOLYTIC ENZYME AGAINST NOSOCOMIAL INFECTING BACTERIA PRODUCED BY BATCH FERMENTATION

**Dhananjay Kashyap, Anjali Parihar, Ritu Raj, Poonam Gupta**
School Of Science (SOS), ITM University, Gwalior, Madhya Pradesh, India
djkashyap223@gmail.com , anjaliparihar2306@gmail.com , Rraj54764@gmail.com , guptapunammp@gmail.com

Pectinase is a general term of enzymes such as pectolyase, pectinolytic and polygalacturonase. These are enzymes breakdown pectin Pectinases enzymes play an important role in the plant cell wall. Pectinase enzymes are produced from a wide variety of microbial sources such as Bacteria, Fungi, Yeast and Actinomycetes. In this paper Bacillus isolated from soil samples of tulsi and sadabahar. The 5 microbes selected of bacillus species. They are pectinases degrading microorganisms. The Identification and characterization of 5 microorganisms of bacillus species. Production of Pectinolytic enzymes by batch types fermentation then purification of pectinolytic enzymes. pectinolytic enzymes production under different substrate, fermentation conditions and application of these enzymes in different industries such as Food industry, Textile industry, Paper industry, Poultry industry etc.. Results of this study indicate that the potential of these microorganisms to produce pectinolytic enzymes that can be useful for many applications is great and must be better explored.antagonistic activity of pectinolytic enzymes against nosocomial infected microbes and enzymes show the antagonistic activity. The pectinolytic enzymes are antimicrobial resistances substances. They are showing antagonistic activity against some pathogenic bacteria.

**Keywords:** Antagonistic activity, Pectinases, Bacillus species, Batch fermentation.

## PP-09

## ASSESSMENT OF ENVIRONMENTAL AWARENESS ON CLIMATE CHANGE AND ITS MITIGATION AMONG LOCAL COMMUNITY. A CASE STUDY OF DELHI. INDIA

**Abhishek Mishra and Nitesh**
Deptartment of Geography, SSN College, University of Delhi
mishra22geo@gmail.com
niteshrohil@gmail.com

The subject of climate change receiving a considerable attention and eliciting widespread interest in India. India is confronted with the challenge of sustaining rapid economic growth amidst the increasing global threat of climate change. Evidences has shown that climate change will effects the distribution and quality of India's natural recourses, which will ultimately threaten the livelihood of the most poor and marginalized section of the population who are closely tied to India's natural resource base. Climate change is a complex and confusing issue at local, national and international level. India should be concerned about climate change since this phenomenon might have substantial adverse impact on them. Not all possible consequences of climate change are yet fully understood, but the three main categories of impact are: Melting of glacier and sea level rise leading to submergence of coastal areas and scarcity of water in plains, Agriculture, As well as increased frequency of extreme events. To understand the perception of local community of Delhi we took an intensive survey in which we inherited Four hundred (400) males and female on the basis of random sampling. We found that only 10% of them had an idea about the mitigation of climate change. So this study shows that it is an urgent message for government and other agencies to create climate change and its management awareness at local level in intensive and effective mode. The media can play an important role to create awareness in regions of climate change adaptation among local committee as well.

**Keywords:** Climate Change, Natural Recourses, Population, Coastal, Management, Community.

## PP-10

## EDIBLE BOWL MADE OF MULTIGRAIN FLOUR FOR PACKAGING

**Preeti Thakur, Shradha Tiwari and Aniket Savita**
Department of Food Technology, ITM University Gwalior

Food packaging is filling up landfills and polluting our oceans and environment. Edible packaging is a solution of this, where no waste by products are produced as they are wholly consumed. Edible bowls are environment - friendly and green alternative to toxic wasteful plastic and polystyrene food containers. The edible crisp wheat or multigrain flour bowls are able to hold any food even hot soups for more than 5 hours, maintaining its crispness and shape. Along with serving food in these bowls, nutritional property and flavour of bowl is also added in food. Biodegradable raw ingredients are used in the making of this bowl like flour (gluten), digestive bran, calorie free sugar, oil, with no artificial colourants or flavourants. From these ingredients 3 types of bowl is made i.e., Choco flavour bowl, pineapple flavour bowl and vanilla pineapple mix bowl. In all of these bowls same ingredients are used except one ingredient and they are cocoa powder, pineapple essence and vanilla-pineapple mix essence in choco bowl, pineapple bowl and vanilla-pineapple mix bowl respectively. Among all of these 3 bowl, choco bowl is best in texture and taste due to use of cocoa powder. The production of edible packaging is currently at research level. It needs to be overcome various obstacles such as improved moisture barrier, cost effectiveness and many more. But instead of these obstacles, edible packaging has bright future and needs further research.

**Keywords:** colourants, flavourants, gluten



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## PP-11

## EMERGING ISSUES OF ENVIRONMENTAL POLLUTION: A REPORT

**Sanjivani Aphale, Bhawana Bisht, Afreen Rangrej and R. K. Mahore***
Govt. Kamla Raja P.G. (Autonomous) College, Gwalior (M.P.)
*Vrinda Sahay Govt, P.G. College, Dabra (M. P.)
bhawanabisht348@gmail.com

Environment is everything that is around us, it can be living or non-living things i.e. physical, chemical, and other natural forces. Increasing industrialization, explosive urban population growth, lack of pollution control, global climate change, ozone depletion, electromagnetic radiation, unabated waste dumping, non-sustainable consumption of natural resources, unsafe use and contamination of chemicals, physical inactivity, poor nutrition, and use of dangerous substances all contribute to affecting the environmental health. Environmental exposure is increasing and affecting environmental health all over the world and emerging risks are being identified every day. Several emerging issues related to environmental pollution are Australia's wildfire, polluted water of river Ganga, The Taj Mahal get polluted day by day. A part from these, there is many such issues which have come before us in the past and are alarming us for gloomy future. The fire in Australia's forests (Amazon) continued to be a topic of discussion in pollution related issues in 2019-2020. In addition, in February 2019, massive forest fires broke out in numerous places across the Bandipur National Park of the Karnataka state in India. Forest fires increase carbon dioxide levels in the atmosphere, contributing to the greenhouse effect and climate change. In addition, ashes destroy much of the nutrients and erode the soil, causing flooding and landslides. To overcome these problems we should start every change by ourselves. The government is taking several steps to curb pollution but to prevent pollution human have to take some steps themselves.

**Keyword:** Environment, forest fire, global warming, hazardous, pollution.

## PP-12
## GREEN CHEMISTRY: HOPE OF GREENER FUTURE

**Divyanshi Jain and Anjali Gupta**
Kamla Raja Girls Government Post Graduate Autonomous College , Gwalior
jaindivyanshi190@gmail.com

Chemical pollution can be caused by a variety of chemicals from a variety of sources and can involve a variety of health effects from simple digestive problems to chemical intoxication and sudden death by poisoning. The effects are usually related to the exposure to high amounts of chemicals which leads to various serious diseases generally by consuming poisonous food, drinking highly contaminated water, or breathing highly contaminated air. Some well publicized incidents from the past few decades are "The Cuyahoga River in Ohio" became so polluted with chemicals it caught fire, "Bhopal Gas Tragedy" a plant accident in Bhopal, India, released methyl Iso Cyanate (MIC), nearly 4000 people died. These hazardous and perilous problems can now be solved by Green and sustainable chemistry, a new philosophy that covers all areas of chemistry. It deals with the development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It is about waste minimization at source, use of catalyst in place of reagents, using non toxic reagents etc. The principle of Green Chemistry is to prevent waste than to treat or clean up waste after it has been created, e.g. the use of phosgene in the synthesis of polycarbonates. Present advantages of Green Chemistry are cleaner air, cleaner water, and increased safety for workers in the chemical industry, safer food, less exposure to such toxic chemicals as endocrine disruptors, lower potential for global warming, ozone depletion and smog formation etc. Green chemistry will help to strengthen societal, economical and ecological sustainability and a powerful step towards a more greener and sustainable future.

**Keywords:** Endocrine disruptors, polycarbonates, phosgene, sustainable chemistry.

## PP-13
## RADON EMANATION: AN INVISIBLE AND SILENT KILLER

**Vartika Tiwari and Sareen Khan**
Kamla Raja Girls Government Post Graduate College, Gwalior
pallavitiwari1719@gmail.com

Radon is naturally occurring gas found in nature by the decay of uranium and is the second leading cause of lung cancer than smoking. Radon emits alpha particle and two progeny which further decay, these progeny binds to the dust or smoke of cigarette and enters in the body then bind to bronchial epithelium causing damage.The alpha particle emitted by radon effect DNA by causing mutation or damage to it mediated by the production of reactive oxygen species which leads to the carcinogenesis. Alpha particles are heavy and therefore, can cause considerable damage at short range. Although



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alpha particles can be stopped by a thin barrier of skin, if the source is inhaled or ingested and lodges against mucosal linings then it can destroy cells. It is generally found in closed space like apartments, mines etc. but are also occurs in soil but entersin house by cracks and various means. For centuries, peoples have flocked to spas to "take the waters", and the water of many of these spas have been found to contain radon. In early 20th century, radiations were touted as having medical benefits; it is used to treat conditions such as arthritis and to feel invigorated and energized but this is in minor cases. After the cases of workers of mines with lung cancer it is treated as hazardous gas which is commonly found in homes and became the cause of lung cancer. About 21000 lung cancer deaths occur because of radon in United States every year. In India, Kerala and Tamilnadu and most probably Southern Karnataka too may have naturally occurring high levels of radon pollution due to the presence of monazite sands which are rich in rare earth elements like thorium. The Major cities might also have some of the higher levels of radon pollution owing to the large number of industrial effluents in the air. However, radon testing hasn't been properly done in most states in India owing to a lack of general awareness and priorities on other, more apparent types of pollution, therefore, its mitigation is needed in households. 4 picocuries (pCi)/L indoor limit is estimated by the environmental protection agency and various methods are available for indoor radon reduction.

**Keywords:** Radon, damage, decay, lung cancer, uranium.

## PP-14
## NEW PROMISING MATERIAL STANENE: PROPERTIES AND APPLICATIONS

**Rishabh Shrivastava, Mahdi Shahrestani, Ranjana Goswami**
School of Sciences ITM University Gwalior MP, India (474001)
ranjanagoswami4@gmail.com

Two dimensional materials (2D) have recently gained large interest due to their excellent electronic properties along with high surface area to volume ratio, in sensors, catalysts, protective coatings, energy storage devices, photonic devices and biological applications. 2D nature of graphene has produced beneficial properties in the prescribed applications but unfortunately the semi metal and chemically inert nature of graphene hinders the development and utilization of its full potential. Keeping in view for the past few years, researchers have paid attention to other elements of the same group as carbon (Si, Ge, Sn), which form a hexagonal structure and are isoelectronic to grapheme. Stanene is set to become a new material, It even allow the electrons to flow with low resistance. In this paper we shall discuss the existence, properties and potential of this promising and wonder material.

**Keywords:** Two dimensional materials (2D); Stanene, graphene,

## PP-15

## ANTAGONISTIC ACTIVITY OF PECTINOLYTIC ENZYME AGAINST NOSOCOMIAL INFECTING BACTERIA PRODUCED BY BATCH FERMENTATION

**Dhananjay Kashyap, Anjali Parihar, Ritu Raj, Poonam Gupta**
School Of Science (SOS), ITM University, Gwalior, Madhya Pradesh, India djkashyap223@gmail.com , anjaliparihar2306@gmail.com , Rraj54764@gmail.com, guptapunammp@gmail.com

Pectinase is a general term of enzymes such as pectolyase, pectinolytic and polygalacturonase. These are enzymes breakdown pectin Pectinases enzymes play an important role in the plant cell wall. Pectinase enzymes are produced from a wide variety of microbial sources such as Bacteria, Fungi, Yeast and Actinomycetes. In this paper Bacillus isolated from soil samples of tulsi and sadabahar. The 5 microbes selected of bacillus species. They are pectinases degrading microorganisms. The Identification and characterization of 5 microorganisms of bacillus species. Production of Pectinolytic enzymes by batch types fermentation then purification of pectinolytic enzymes. pectinolytic enzymes production under different substrate, fermentation conditions and application of these enzymes in different industries such as Food industry, Textile industry, Paper industry, Poultry industry etc.. Results of this study indicate that the potential of these microorganisms to produce pectinolytic enzymes that can be useful for many applications is great and must be better explored.antagonistic activity of pectinolytic enzymes against nosocomial infected microbes and enzymes show the antagonistic activity. The pectinolytic enzymes are antimicrobial resistances substances. They are showing antagonistic activity against some pathogenic bacteria.

**Keywords:** Antagonistic activity, Pectinases, Bacillus species, Batch fermentation.

## PP-16

## NOVEL CORONAVIRUS: A GLOBAL HEALTH THREAT

**Pragya Sharma, Shivangi Verma and Nisha Bahroliya**
Govt. Kamla Raja Girls P.G. (Autonomous) College, Gwalior (M.P.) nishabahroliya33@gmail.com

Coronaviruses (CoV) are a large family of viruses that cause illness ranging from the common cold to more severe diseases such as Middle East Respiratory Syndrome (MERS-CoV) and Severe Acute Respiratory Syndrome (SARS-CoV). A novel coronavirus (nCoV) is a new strain that has not been previously identified in humans. They are zoonotic, meaning they are transmitted between animals and people and are common in many different species of animals, including camels, cattle, cats, and bats. Detailed investigations found that SARS-CoV was transmitted from civet cats to humans and MERS-CoV from dromedary camels to humans. Several known coronaviruses are circulating in animals that have not yet infected humans. Common signs of infection include respiratory symptoms, fever, cough, shortness of breath and breathing difficulties. In more severe cases, infection can cause pneumonia, severe acute respiratory syndrome, kidney failure and even death. Standard recommendations to prevent infection spread include regular hand washing, covering mouth and nose when coughing and sneezing, thoroughly cooking meat and eggs. Avoid close contact with anyone showing symptoms of respiratory illness such as coughing and sneezing. World Health Organization (WHO) now officially declared it as global health emergency and is working closely with global experts, governments and partners to rapidly expand scientific knowledge on this new virus, to track the spread and virulence of the virus, and to provide advice to countries and individuals on measures to protect health and prevent the spread of this outbreak. Future research on coronaviruses will continue to investigate many aspects of viral replication and pathogenesis.

**Keywords:** Nidovirales; Coronavirus; positive-sense RNA viruses; SARS-CoV; MERS-CoV



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## PP-17

## INSILICO COMPARATIVE MODELING AND STRUCTURE PREDICTION OF APO-COPZ COPPER TRANSPORT PROTEIN FROM ENTEROCOCCUS HIRAE

**Santosh Kumar*, O.P. Verma, Nem Kumar Jain and Poonam Gupta**
Department of Life Sciences, ITM University, Gwalior, M.P., India
School of Pharmacy, ITM University, Gwalior, M.P., India
Department of Molecular and Cellular Engineering, Jacob School of Biotechnology & Bioengineering, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India

Enteroccoci are gram positive bacteria that are nosocomial pathogens and necessary for development and transmission of antibiotic resistance traits. Enterococcus hirae, is the member of the Enterococcus genus and cause the infection in animals like young formed species and psittacine birds. But it is very difficult in humans. The first case of E. hirae infection is septicemia reported in a patient with end stage renal disease undergoing hemolysis, resulting in the infection at an early age and relatively low mortality rates. Septicemia is a serious bloodstream disease also known as blood poisoning. It may be life threatening disease. When septicemia isn't treated it can progress to sepsis which can cause inflammation in the whole body. Blood clots and block oxygen can be caused by this inflammation, resulting is organ failure. Infection caused by septicemia are- urinary tract infection, kidney infection, lung infection (pneumonia), and infection in abdominal area. The symptoms of septicemia are- Chills, fever, fast breathing, fast heart rate, confusion in thinking, and nausea and vomiting etc. The physico chemical characterization of the Apo-copZ copper transport protein isolated from Enterococcus hirae was done to interpret properties like Isoelectric point (pI), EC, AI, GRAVY and instability index. Phylogenetic prediction to study evolution and In silico comparative modeling was performed to generate good quality models. The assessment of generated three dimensional structure against structure verification tools PROCHECK and WHATIF showed that model generated by Swiss Model was more acceptable to that by Geno3D. The structure was stable and could be used for further designing inhibitor against the diseases.

**Keywords:** Enterococcus hirae, nosocomial, GRAVY, PROCHECK, Geno3D

## PP-18
## STUDY ON (RTS) MADE WITH BLEND OF KOKUM AND POMEGRANTE JUICE

**Sweeta Pandey, Mukul Shrivastava, Suhavani Awasthi and Jay Tiwari**
Department of Food Technology, SOS ITM University Gwalior (MP) sweetapandey3991@gmail.com

Pomegranate is commercially fruit grown throughout the word. Juice is very nutritious and useful due to its medicinal value. In the present study the qualitative and quantitative analysis of (RTS) ready to serve drink made from blend of pomegranate and kokum juice. The blended juice were prepared pomegranate and kokum i.e., A;- 50-50,B:- 60-4, C:- 70-30, D:-80-20. The physiochemical analysis as well as sensory parameter has been observed. It was observed that reducing sugar values decreases (1.073-0.467) and acidity of the RTS increases (.26% - .44%). Vitamin c, total phenolic compound, non-reducing sugar and protein has been observed. Nutritional properties of the blended RTS increased with addition of kokum. Indicating that the blending of RTS with kokum increases its health benefiting properties.

**Keywords:** Pomegranate, phenolic compound, RTS, kokum juice.

## PP-19
## SYNTHESIS, CHARACTERIZATION, FLUORESCENCE BEHAVIOR OF MN(II) ALKYLDITHIOCARBAMATE

**Rupali Rastogi*, Nidhi Mittal**
1Department of Chemistry, ITM University, Gwalior, 474009 India
rupali.rastogi.chemistry@itmuniversity.ac.in

A dithiocarbamate is a functional group in organic chemistry. It is the analog of a carbamate in which both oxygen atoms are replaced by sulfur atoms. A common example is sodium diethyldithiocarbamate. Dithiocarbamates and their derivatives are widely used in the vulcanization of rubber. New complexes of manganese(II) corresponding to various alkyl dithiocarbamatehave been synthesized and characterized by microelemental analyses (C, H, N and S), magnetic susceptibility, molar conductance, and spectral analyses including ESI mass spectrometry, IR, and UV-visible, fluorescence. The presence of a six coordinated Mn atoms has been established in the adducts.

**Keywords:** thermal analysis, fluorescence, susceptibility, molar conductance



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## PP-20
## PHYSICOCHEMICAL AND PHYTO-CHEMICAL PROPERTIES OF KACHARI (WILD FRUIT OF BUNDELKHAND AREA)

**Hradesh Rajput and Pratistha Srivastav**
Department of Food Technology, ITM University, Gwalior (M. P.)
hrdesh802@gmail.com

Desert area is gifted with valuable natural resources particularly arid fruits and vegetables. Arid fruits are used by native people as a prime source of food with some traditional value attached to it. Kachri (Cucumis callosus) is an annual climber, which belongs to family cucurbitaceae. Its plants thrive well throughout the semi-arid region of Rajasthan. Kachri plants are found as wild or cultivated in kharif season in different parts of Rajasthan specially in westem districts viz., Bikaner, Churu, Jhunjhunu, Nagaur, Jaislmer, Jodhpur, Barmer, etc. Kachri fruit has very good amount of nutrients like vitamins, minerals, carbohydrates, etc. The 100 gm of fresh edible portion of kachri has 88.8% moisture, 7.45% carbohydrate, 47-54 kcal energy, 0.28% protein, 1.28% fat, 1.21% fibre, 1.46% total ash, 0.09 mg calcium, 0.0029 mg phosphorus, 0.182mg iron, 0.0046 mg copper, 0.052 mg zinc and 29.81 mg vitamin C. The kachri was mainly consumed as a vegetable in the desert of the western Rajasthan but it has good herbal therapeutic value too. The kachri fruits were used as a cooling light cleanser for the skin. They were also used as a first aid treatment for burns and abrasions. The flowers of kachri were used as expectorant and emetic while fruits were used as diuretic and emetic. Fresh as well as dehydrated fruits of kachri are used for preparation of pickles, chutney, and vegetable. Approximately 75 per cent produce of kachri is used as tart in cooked vegetables. The post harvest losses in kachri vary from 30-40 per cent due to its perishable nature and glut during harvesting time, which also reduce its market value.

**Keywords:** Cucurbitaceae, dehydrated, kachri and vegetable.

## PP-21
## UTILIZATION OF CHHANA WHEY FOR PREPARATION OF VEGETABLE SOUP

**Pratistha Srivastava and Hradesh Rajput**
Department of Food Technology, School of Sciences, ITM University Gwalior, M.P
pratistha.shri@gmail.com

Whey is an excellent beverage base and genuine thirst quencher. Although it is very nutritious and possesses medicinal properties, treated waste dairy by-products. Although this waste contributes to pollution and but also values the dairy products. Channa whey is a type of whey which is very nutritious for human being and it also very important for therapeutic purposes. Chhana whey soup prepare from channa whey increases the appetite and helpful in case of diarrhea and liver problems.

It also contains a good amount of carbohydrate, fat, protein and minerals. There is an essential need to develop whey vegetable soup with enhanced nutritional and chemical attributes. In this proposed work Whey vegetable soup was prepared using different treatment combinations of vegetable paste and channa whey (T150:50, T260:40, T370:30, T4 80:20). Therefore the treatment T4 was found to be the best in chemical characteristics.

**Keywords:** Channa whey, Vegetables Soup, Nutritional properties.

**PP-22**

## PHYLOGENETIC PREDICTION AND IN SILICO COMPARATIVE MODELING OF GLYCOPROTEIN FROM NIPAH VIRUS

**Anjali Parihar, Santosh Kumar*, Nem Kumar Jain and O.P. Verma**
Department of Life Sciences, ITM University, Gwalior, M.P., India
School of Pharmacy, ITM University, Gwalior, M.P., India
Department of Molecular and Cellular Engineering, Jacob School of Biotechnology & Bioengineering, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India
santoshmtech73@gmail.com

Nipah virus (NiV) is a highly pathogenic member of the family paramyxoviridae that encodes the surface glycoprotein F and G. Nipah virus , a member of the genus Henipavirus also belong to family paramyxoviridae is highly pathogenic to many species which emerged in 1998 from pteropod fruit bats ( flying foxes) and microbats of several species . Nipah virus (NiV) and Hendra virus (HeV) are newly identified members. Their recent emergence as zoonotic pathogens capable of causing illness and death in domestic animals and humans is a cause of concern. It caused an outbreak of severe respiratory disease in pigs and fatal encephalitis in humans and high mortality rate. NiV can infect a large variety of mammalian species. Transgenic cell lines were generated that expressed either the attachment protein (G) or the fusion protein (F) of NiV. Functional expression of NiV F and G was verified by complementation with the corresponding glycoprotein, which resulted in the development of syncytia. When exposed to NiV and HeV, expression of NiV G in Crandall feline kidney cells resulted in a qualitative inhibition of both cytopathic effect (CPE) and cell death by both viruses. A recombinant soluble form of the HeV attachment (G) envelope glycoprotein (sGHeV) has proven highly effective in protecting small animals from lethal NiV and HeV challenge when used as an immunogen. The phylogenetic prediction, insilico comparative modeling and physicochemical characterization of the envelope glycoprotein isolated from Nipah virus was done using different bioinformatics tools. The assessment of generated three dimensional structure through Geno3D software against structure verification tools PROCHECK and WHATIF showed that model generated was acceptable and showed the best results in three dimensional space. The predicted model can be used in structure based drug designing and vaccine development.

**Keywords:** Nipah virus, insilico, HeV, PROCHECK, Geno3D



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**PP-23**

## A TAXONOMIC STUDY FOCUSING ON THE ANGIOSPERMIC PLANTS IN MID-UTTAR PRADESH REGION

**Ritu Srivastava, Nancy Gupta, Keshav Shukla* and Adarsh Pandey**
Department Of Botany, SS PG College Shahjahanpur 242001 Up India keshavshukla1689@gmail.com

District Shahjahanpur occupies the southest corner of Rohilkhand division and is located at 27.88°N 79.91°E. It has an average elevation of 194 metres (600 feet). It is situated at the junction of two rivers, namely Khannaut and Garra. The climate of district Shahjahanpur is generally defined to be tropical monsoon type. District Shahjahanpur is subdivide into three zones and samples of different variety of angiospermic plants were collected and about 30 plant spp. were identified, belonging to 18 families; collected plants were classified into two angiospermic categories dicot and monocot; among them dicot plant were found more likely in comparison to the monocots, and the family Euphorbiaceae found Dominating among the studied angiosperm families. In this survey we have observed medicinal plants in excess in along with great variation in the flora at Shahjahanpur.

**Keywords:** Shahjahanpur, Flora, Angiosperm, Polypetalae, Khannaut and Garra.

**PP-24**

## EFFICACY OF CROCUS SATIVUS (SAFFRON) IN THE PREVENTION OF CYSTIC FOLLICLES AND ADENOMYOSIS IN RATS

**Haroon Bashir Zargar**
Sri Satya Sai University of Technology and Medical Sciences, Sehore (M.P.) 466001
phdzoologysssutms@gmail.com

To evaluate the antifertility activity of Crocus Sativus leaves on female rats. The plant extract was tested for its effect on implant formation at two dose levels, 300 and 600 mg·kg−1, respectively. The effective methanolic plant extract was further studied for estrogenic potency on ovariectomised immature female rats. The data presented in this study demonstrate the antifertility potential of Crocus Sativus methanolic leaf extract, which shows a strong and significant decrease in implant formation (100%), and a strong estrogenic effect resulting in a significant increase in uterine weight in immature ovariectomised rats. These observations suggest that the methanolic extract of Crocus Sativus leaves has strong anti-implantation activity and estrogenic activity. The methanolic plant extract of Crocus Sativus has antifertility activity.

**Keywords:** Crocus Sativus; Cystic follicles; Adenomyosis; Antifertility.

## PP-25

## SOME NEW DISTRIBUTIONAL RECORDS OF ENCYRTIDAE (HYMENOPTERA: CHALCIDOIDEA) FROM AGRO-CLIMATIC ZONES OF JHARKHAND, INDIA

**1Manendra Kaneria, 2Sudhir Singh**
Forest Entomology Discipline, Forest Protection Division, Forest Research Institute, Dehradun
kaneria.manendra@gmail.com

Present study is based on surveys done to assess the current status of encyrtid parasitoids in different agro-climatic zones of Jharkhand state during year 2018. Encyrtid parasitoids are very important in order to check the populations of other harmful insects which damage valuable agricultural and forestry crops. Therefore, they are efficient biological control agent and being used for controlling insect-pest infestation in crops. At present, more than 5,000 species of encyrtids belonging to 506 genera are known world-wide. In India, encyrtids are represented by nearly 750 species spread over 156 genera, which is about 15% of the species known from all over the world. Previous studies merely explored the status of encyrtids parasitoid in Jharkhand state. During the current study, 35 species belonging 24 genera are recorded for the first time from three agro-climatic zones of state. The material was collected using active and passive methods during field surveys. All species were identified using Nikon SMZ-U stereozoom microscope in the systematic laboratory and deposited in the National Forest Insect Collection of Forest Entomology Discipline, Forest Protection Division, Forest Research Institute, Dehradun.

**Keywords:** Encyrtid, species, biological control.

## PP-26

## IMPACT ASSESSMENT ON HUMAN BEHAVIOUR AND HEALTH ON ACCOUNT OF NOISE POLLUTION IN JHANSI, BUNDELKHAND (INDIA)

**Dheerendra Singh Chauhan and Abhimanyu Singh**
Department of Environmental Science, Bundelkhand University Jhansi-284128 (U.P.) India
dschauhanevs@gmail.com, abhimanyu_geol@yahoo.co.in

The evolution of human civilization is dependent on industrialization to a large extent. In India, the urban population is rising at a fast rate compared to the total population of the world. In the developing world, this growth is extensively spread and heavily concentrated in a few mega cities. Crowded cities and towns, mechanized means of transport, new devices of recreation and entertainment are polluting the atmosphere with their continuous noise from which there is virtually no escape, no matter where we are, in our homes and yards, on our streets, in our cars, at theaters, restaurants, parks, arenas, and in other public places. Noise directly or indirectly aggravates the already deteriorated status of public health. CPCB conducted many surveys on noise level in metropolitan cities of India. Results



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convince that noise pollution is crossing limits. Jhansi region is also experience lots of changes resulted in increase in noise level which may have its effect on the health and work performance of citizens and visitors. To understand the levels of noisespecially in the Jhansi city and it impact on the people having their livelihood. Noise level have been monitored by using Sound level meter as well as with the help of questionnaire from the common people sources where noise causing annoyance been identified and adverse impact on health of the people exposed being studied to fourteen different selected area. As a whole monitoring the noise level at different area are identified in ascending orderviz; MLB Medical College (71.5)<Veerangna Nagar (72.8)<Bundelkhand University(73.7) <Civil Lines (76.1) <Shivaji Nagar (77.2) < Civil Hospital (78.3) <ManikChawk (78.9)<District Court (79.1) <Sipri Bazar (79.6)< Elite Chauraha (81.3)< Bus Station (81.6) <Gora Machhiya (82.7) <B.H.E.L. (83.0)< Jhansi Junction Railway St. (84.7). Traffic noise was among major source causing annoyance followed by train and loudspeaker being area specific further in inner areas home appliances noise also prevails. Noise level of different area has significantly positive relationship with irritation, cardiovascular problems and hearing loss and BP problem. All the psychological aspects viz; Headache, Fatigue, Hypertension, Aggressiveness, Irritation and Sleep disturbance have found positively and strongly related to the level of noise except aggressiveness. The noise can cause physiological and psychological deterioration that accompanies it as an inevitable part of our lives. Conclusion drawn is Railway station area was nosiest zone. Major source of noise come from transport sectors and rock crusher zones in the Mining area. Further Noise shows positive correlation for most of the health parameter undertaken. This paper deals with impact on human behaviour of noise pollution. In this connection, Adolescent education, Neural-effects, Occupational Environment, Transportation, Psychological and Physiological effects will also be discussed in detail.

**Keywords:** Noise, Health impacts, CPCB, Psychological aspects, Human behaviour.

## PP-27

## EFFICIENCY OF VINCA ROSEA (LEAF) ON REMOVAL OF LEAD FROM SYNTHETIC AQUEOUS SAMPLE

**Arti Agashe* and R. K. Khare**
Department of Botany, Govt. Model Science College, Gwalior, (M.P.) arti.agashe@gmail.com

Increasing urbanization, industrialization and over population is one of the leading causes of environmental degradation and pollution. Pb which is one of the heavy metal if found more than 0.01 mg/l (Portable water) show hazardous effects on all living things. Waste water treatment through conventional methods is expensive and difficult to get optimum result. Adsorption is a physical process where soluble molecules (adsorbates) are removed by attachment to the surface of a solid substrate (adsorbent) primarily by Van der Waals forces, although chemical or electrical attraction may also be important. In the present studies, parameters such as pH, contact time, initial metal concentration, adsorbent dose has been studied. Result showed that the Vinca rosea was found an effective adsorbent for the removal of Pb.

**Keywords:** Adsorption, Lead (Pb), Plant adsorbent, Vinca rosea.

## PP-28
## HOMOLOGY MODELING AND STRUCTURE PREDICTION OF BLOOM SYNDROME CAUSING PROTEIN ISOLATED FROM LIPARIS TANAKAE

**Minisha Bagaria, Santosh Kumar*, Namrata Jha and O.P. Verma**
Department of Life Sciences, ITM University, Gwalior, M.P., India
Department of Molecular and Cellular Engineering, Jacob School of Biotechnology & Bioengineering, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India
santoshmtech73@gmail.com

Bloom syndrome is a rare human disorder which is an autosomal recessive disease which belongs to the group of chromosomal breakage syndrome. Firstly, Dr. David Bloom, a New York dermatologist described this disease in 1954 in three childrens as congenital telangiectatic erythema resembling lupus erythematous in dwarfs. This can be examined by genetic instability, which includes high number of sister chromatid exchanges. The predominant and clinical feature of bloom syndrome is pre and postnatal growth retardation. Other clinical features of bloom syndrome are narrow facies, nasal prominence, facial sun sensitive, immuno deficiency, respiratory tract and gastrointestinal tract infection. There is increase in 10 folds increase in the rate of sister chromatid exchanges as compared with normal cells. Bloom syndrome can be characterized by prenatal and postnatal growth. This is caused by the loss of the function of blm genes which codes for RecQ helicase, which causes bloom syndrome. This is a prototypical chromosomal instability syndrome and somatic mutations that occur as a result of that instability are responsible for increased cancer risk also. Physiochemical characterization of protein isolated from Liparis tanakae responsible for Bloom syndrome disease with 446 amino acids was done to interpret properties like pI, EC, AI, GRAVY and instability index. In silico comparative modeling was performed to generate good quality models. The assessment of generated three dimensional structure against structure verification tools PROCHECK showed that model generated by Geno3D was acceptable as compared to SWISS MODEL. The predicted model can be used in structure based drug designing and vaccine development

**Keywords:** Bloom syndrome, in silico, PROCHECK, GENO3D

## PP-29
## INSILICO COMPARATIVE MODELING AND STRUCTURE PREDICTION OF NUCLEOCAPSID PROTEIN OF PORCINE EPIDEMIC DIARRHEA VIRUS IN PIGS

**Dhananjay Kashyap, Santosh Kumar* and O.P. Verma**
Department of Life Sciences, ITM University, Gwalior, M.P., India





Department of Molecular and Cellular Engineering, Jacob School of Biotechnology & Bioengineering, Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj, Uttar Pradesh, India
santoshmtech73@gmail.com

Porcine epidemic Diarrhea Virus (PEDV) is a highly contagious pathogen that can cause severe diseases in pigs. It was first recognized as a devastating enteric disease in feeder and fattening pigs, resembling Transmissible Gastroenteritis in pigs in the United Kingdom, in 1971. It is a member of the Coronaviridae family; PEDV infects mainly the epithelial cells of the porcine intestine, leading to acute diarrhea, vomiting and dehydration. The high morbidity and mortality is caused by PEDV in the newborn piglet (up to two weeks old) among which mortality ranges between 50 -100%. The PEDV, coronavirus nucleocapsid (N) protein, plays important roles in the process of virus replication and cellular infection. Virus infection and transfection showed that N protein was predominately localized in the cytoplasm but also present in nucleolus. Like others RNA viruses, PEDV has high evolutionary rate and is prone to genetic mutations. There are two different types of PEDV that is Type I which only affects growing pigs and Type I is seen in low number. Type II affects all ages, including sucking pigs and mature sows and Type II is a more virulent strain that caused the death of over 1 million pigs in the USA in 2013-2014.Treatment is symptomatic and aims to prevent dehydration in young pigs, using products such as electrolyte and energy supplements. Biosecurity methods such as adequate quarantine, isolation of cases, and disinfection help prevent entry or spread of the disease in the herd. PED is common in the USA, Canada, China, Korea, Japan, Thailand and Vietnam, as well as European countries. Physiochemical characterization of protein isolated from pigs responsible for Porcine Epidemic Diarrhea disease with 441 amino acids was done to interpret properties like pI, EC, AI, GRAVY and instability index. In silico comparative modeling was performed to generate good quality models. The assessment of generated three dimensional structure against structure verification tools PROCHECK showed that model generated by Swiss Model was more acceptable to that by Geno3D. The predicted model can be used in structure based drug designing and vaccine development.

**Keywords:** Porcine Epidemic Diarrhea Virus (PEDV), Nucleocapsid Protein, PROCHECK, GENO3D

## PP-30
## EFFECT OF SEED TREATMENTS AND POTTING MEDIUM ON SEED GERMINATION PARAMETERS IN THREATENED STEREOSPERMUM SUAVEOLENS (ROXB.) DC. – A DASHMOOL SPECIES

**Hari Om Saxena1, Naseer Mohammad2, Samiksha Parihar1 and Sant Kumar1**
1NWFP section, Silviculture, Forest Management& Agroforestry Division
2Genetics and Tree Improvement Division
Tropical Forest Research Institute, Jabalpur (M.P.), India

An experiment was conducted to investigate the effect of different seed treatment and potting media on germination percentage and associate parameters in Stereospermum suaveolens, a threatened

dashmool species during May, 2019 at Silviculture Nursery of Tropical Forest Research Institute, Jabalpur (Madhya Pradesh). Experimental treatments comprised of twenty treatment combinations consisting of four different seed treatment and five growth medium. Data on daily seed germination was recorded and used for estimation of final germination percentage (FGP), mean germination time (MGT), coefficient of velocity of germination (CVG), germination rate index (GRI), time spread of germination (TSG), energy period (EP) and peak value of mean germination (PVMG). Critical perusal of analysis revealed that treatment combination 'Sand + Hot Water' was resulted in positive effect on all the characters studied and could be used mass raising of seedlings of Stereospermum suaveolens.

**Keywords:** Stereospermum suaveolens, seed germination, growth medium, seed treatment.

## PP-31
## STUDY ON CELLULOLYTIC POTENTIAL OF ACTINOMYCETES PRODUCING PECTINASE WITH IT'S APPLICATIONS

**Sonali R. Bhagat**
Sau Vasudhatai Deshmukh college of Food Technology Amravati
shbhagat8@gmail.com

Cellulose is the most copious biopolymer present on the earth which can be degraded chemically as well as enzymatically. Cellulases enzymes can be produced by variety of microorganisms including fungi and bacteria. Chiefly fungi degrades the cellulose but Actinomycetes also takes part in lignocelluloses degradation which results of their capacity to synthesize pectinases, cellulases etc. Streptomyces species raised from actinomycetes produce 80% of metabolites. Actinomycetes are the predominant group of soil population which is filamentous and Gram positive, have the potential to use polysaccharides such as pectin, xylans, cellulose as a carbon source which is accomplished through the production of extracellular hydrolytic enzymes that can be used for industrial and biotechnological applications. The increasing demand of pectinolytic enzymes in various sectors has raised the search for production of different types of pectinolytic enzymes. Pectic substances are the complex polysaccharides present in plant tissues. They are classified into homogalacturonan, rhamnnogalacturonan I and rhamnogalacturonan II. There are various pectinolytic enzymes like pectin lyases, pectin methyl esterase and polygalacturonases acidic and alkaline pectinases. Pectinase can be produced by two fermentation techniques i.e solid state fermentation and submerged fermentation. Pectinase is essential enzyme with wide ranging applications in wine processing, paper and pulp industry, oil extraction, textile industries and others. Therefore, this enzyme proves to be a promising enzyme for commercial and industrial applications.

**Keywords:** Cellulose, Actinomycetes, pectinase, industrial applications.



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## PP-32
## DOUBLING OF FARMER INCOME THROUGH DIVERSIFICATION OF AGRICULTURE

**Kritika Garg, Vishaka Shrivastava and Devesh Mohne***
Govt. Kamla Raja Girls P.G. (Autonomous) College, Gwalior (M.P.)
Shrimant Madhavrao Scindia Govt. Model Science College, Gwalior (M.P.)

Persistent low level of farmer's income can cause serious adverse effect on the future of agriculture in the country. To secure future of agriculture and to improve livelihood of half of India's population, adequate attention needs to be given to improve the welfare of farmers and raise agricultural income. Adaption and acceptance of new varieties as well as new and upcoming production technologies can potentially strengthen farmers' cropping systems by increasing yields, improving drought resilience, boosting resistance to pests and diseases and also by capturing new market opportunities. There is a need to identify crops and varieties that may suit to a range of environments and farmers' preferences. Crop diversification provides better conditions for food security and enables farmers to grow surplus products for sale at market and thus help to obtain increased income to meet other needs related to household well-being. Crop diversification can enable farmers to gain access to national and international markets with new products, food and medicinal plants. Diversifying from the monoculture of traditional staples can have important nutritional benefits for farmers in developing countries and can support a country for becoming more self-reliant in terms of food production. Agriculture diversification is required If farmers are to remain on the land they need to generate greater income from that land than they could by growing basic staples. India is one the promoting leader in Agriculture diversification, the concept is applied both to individual farmers and to different regions, with government programmes being aimed at promoting widespread diversification.

**Keywords:** Agriculture, diversification, environment, farmers, Income.

## PP-33
## INFLUENCE OF SOME FACTORS ON THE GROWTH OF R-, S- AND M - DISSOCIANTS OF THE RHODOCOCCUS RUBER - 8/4/1 STRAIN

**Alimova B.Kh., Kambaralieva M.I., Pulatov O.M., Sharifov M.R., Davranov K., Makhsumkhanov A.A.**
Institute of Microbiology, Uzbekistan Academy of Sciences, Tashkent, Uzbekistan balimova@list.ru

Actinobacteria of the Rhodococcus genus have a wide range of enzymatic activity (nitrilase, amidase, nitrile hydratase, oxidoreductase, esterase, epoxide hydrolase and etc.), so they are widely used in biotransformation processes of organic compounds. However, they may be subject to dissociation, differing in genetic, physiological, biochemical and morphological properties. The purpose of

this work is to study the ability of the Rhodococcus ruber - 8/4/1 strain under the influence of changing environmental conditions to form morphological dissociants. The object of the study is the Rhodococcus ruber - 8/4/1 strain – producer of nitrile hydratase, deposited under number of SKB-318 at the collection of microorganisms of Institute of Microbiology, Uzbekistan Academy of Sciences, and its R-, S - and M - dissociative forms. The form dissociation evidence this strain was discovered during its long-term storage on nutrient agar at 4oC temperature, for 8 months storage of culture cell suspension in 10% glycerol at -18oC and during study of cells' resistance in different concentrations of acryl amide. The intensity of splitting process of the strain during its long-term storage showed that the Rhodococcus ruber – 8/4/1 forms three colony forms. R-form colonies are rough, with a folded matte surface dry colonies with uneven edges, in a liquid nutrient medium gives a precipitate, sometimes a film, while the medium itself remains transparent. S-form colonies are smooth, convex, shiny, with sharply defined edges, homogeneous growth in liquid nutrient media. The M - form colonies are larger and slimy, spreading, shiny, and lighter than the S – form and its growth is homogeneous in liquid nutrient media. The influence of the pH of the medium on the growth and variability of R-, S, and M-dissociants of the Rhodococcus ruber - 8/4/1 strain was studied. All three dissociants differ quite significantly in their sensitivity to pH. Thus, the R-form has an optimal pH value 7.5-9.0. The optimum pH of the S-form is shifted to the weakly acidic zone -6.0-7.5 and growth at pH=9.0 is almost completely suppressed. The M- form has the widest optimum pH zone, which is in the range of pH=5.5-9.5. But, under mildly acidic conditions the number of cells of this variant is significantly reduced. There is no growth at pH below 5.0. The resistance of the forms to some external factors has been established. The R-form has a selective advantage during UV-irradiation, storage and temperature of cultivation; S-form is resistant at lower values of acidity of the medium; M-dissociant is resistant by lowering of cultivation temperature and increasing of NaCl concentration in the medium.

**Keywords:** Rhodococcus, colony, forms, dissociant, nutrient medium.

## PP-34
## CHARACTERIZATION OF THE RHODOCOCCUS RUBER-8/4/1 STRAIN-PRODUCER OF NITRILE HYDRATASE

**Kambaralieva M.I.**
Institute of Microbiology, Uzbekistan Academy of Sciences, Tashkent, Uzbekistan k_marguba@mail.ru

Recently, the interest of researchers in the biotechnological potential of using of alkanotrophic rhodococci has been strongly increased. Active and stable strains of rhodococci are widely used in the production of amides and their derivatives, substances for pharmaceuticals, bioremediation of the environment from xenobiotics, in the system of purification of hydrocarbon pollution of the biosphere, treatment of waste water and soil from oil pollution, biodestruction of persistent organic and pharmaceutical pollutants. The purpose of this work is to characterize the Rhodococcus rubber-8/4/1 strain – producer of nitrile hydratase, used in the biotechnological process of acrylamide production.



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The strain is characterized by the following morphological, cultural, physiological and biochemical characteristics. According to morphological characteristics, the Rhodococcus ruber - 8/4/1 strain is a gram positive aerobic, motionless, not acid-resistant and not spore-forming bacterium. At different stages of the life cycle, the cells of the isolated strain differed in morphology. In the initial stage of growth, germination and branching of the original coccoid and short rod-shaped cells begins with the formation of one or three growth tubes. In the exponential stage of development (10-12 hours), cells with a length of 6.0-12.0 x 0.6-0.9 microns are detected with a profusely branching mycelium, which is fragmented into short, uneven rod-shaped and coccoid elements. In 30-40-hour cultures, there are branching cells with a length of 4.0-5.0 microns and a small number of shorter fragments. There is a three-stage morphogenetic cycle of development (cocci-rod-shaped, thread-like or branching cells-cocci). Culture properties of the strain on standard laboratory media at a temperature of 28-30 °C, pH 6.5-7.5 form colonies of a soft consistency without air mycelium with a pinkish-red color. By its physiological properties, the strain reduces nitrates to nitrites. It doesn't form acid on arabinose, galactose, maltose, sucrose, lactose and inositol. Acid formation was detected on glycerin. No gas formation was detected on any sugar. Test with methyl red and Voges-Proskauer reaction are negative. Hydrolytic enzymes are absent. Amidase is detected. Nitrile hydratase is cobalt dependent. The cobalt acts as a cofactor of the enzyme, and the urea serves as an inducer for biosynthesis. The given characteristics of the strain generally correspond to the modern view of the genus Rhodococcus Zopf (1891), assigned (Goodfellow, 1992) to the family Nocardiaceae (Castellani and Chalmers, l919), Actinomycetales (Buchanan, 1917).

**Keywords:** Rhodococcus, strain, characteristics, taxonomy.

## PP-35
## BIOSYNTHESIS OF CITRIC ACID BY NATURAL STRAINS OF MICROMYCETES

**Kholmuradova N.K., Pulatov O.M., Alimova B.Kh., Makhsumkhanov A.A., Zukhriddinova N.Yu., Tashbaev Sh.A.**
Institute of Microbiology, Uzbekistan Academy of Sciences, Tashkent, Uzbekistan
nishona1989@mail.ru

Citric acid (CA) is widely used in the food, pharmaceutical, cosmetic, and processing industries as an oxidizer, antioxidant, and preservative. Almost all CA produced in the world is obtained by microbiological synthesis, which uses Aspergillus niger strainss as producers. Currently, in Uzbekistan, all consumable citric acid is widely represented by foreign companies. In this regard, obtaining a highly effective local strain of the CA producer acquires not only scientific, but also commercial significance. The purpose of this work is to optimize the parameters of cultivation of the CA producer, namely, to study the effect of the initial number of spores and the cultivation temperature on the biosynthesis of CA by natural strains of micromycetes. It was found that during the cultivation of various strains of micromycetes of Aspergillus sp. (15 strains) with the initial amount of 2x105 and 4x106 spores/ml, the maximum CA biosynthesis reached 4.2-10.5 g/l. Whereas, the reduction of the introduced number of spores (9x103 to 1x104

spores/ml) positively affected the CA biosynthesis and the CA content in some strains increased from 1.4 to 1.7 times. It was shown that in the growth dynamics of natural strains with the introduction of reduced amounts of spores, the maximum biosynthesis of CA is observed in the initial hours of cultivation. Further cultivation (up to 120 hours) of fungus didn't affect on the formation of CA. An important technological factor that determines the growth of producers and biosynthesis of organic acids is the cultivation temperature. It was found that favorable conditions for the growth of the producer and the biosynthesis of CA were achieved at 26-28 0C. Increasing the temperature of the culture medium to 34 0C negatively affected the synthesis of CA. Thus, the highest biosynthesis of CA in the growth dynamics of natural strains of micromycetes is observed in the initial hours of cultivation, while it is of great importance to select the optimal amount of introduced inoculate (spores) and the cultivation temperature, which is the basis for further research on development of highly active local CA producers.

**Keywords:** citric acid, microbial synthesis, mycelial fungi.

## PP-36

## ISOLATION OF PHOSPHATE SOLUBILIZING BACTERIA FROM RHIZOSPHERE OF THREE PLANT SPECIES AND THEIR HEAVY METAL TOLERANCE

**Shivani Tripathi and Mahendra K. Gupta**
School of Studies in Botany, Jiwaji University, Gwalior (M.P.)-474011, India

Phosphorus serves as backbone of the complex nucleic acid structure of plants and is second majorly required macroelementafter nitrogen. Phosphorous (P) is present insufficient amount in agricultural soils but generally, it is unavailable for plant growth and development due to fixation and immobilization.Thus, microorganisms with P-solubilizing ability have proven significant to plants by providing P which is required for healthy plant growth. Therefore, the present study is carried out to isolate P solubilizing rhizobacteria from 3 different plant species (Solanummelongena, Cicerarietinum, Freriaindica). Along with this, the PSB isolates were then also tested for their heavy metal tolerance, as these heavy metals cause serious problems such as pollution, soil depletion etc. due to their accumulation in the environment and soil. In this study, 10 phosphate solubilizing bacterial (PSB) strains were isolated from rhizospheric soil of plant species and out of which five PSBs showed high efficiency for phosphate solubilization. The selected strains showing high P solubilization were then analysed for tolerance against six heavy metals such as cadmium (Cd), chromium (Cr), lead (Pb), zinc (Zn), copper (Cu), mercury (Hg) at different concentrations i.e., 1%, 0.5% and 1% and showed different patterns of resistance. Hence, use of these phosphate solubilising bacterial strains as bio-inoculants will increase the available phosphorous, also reduces metal pollution through enhancing soil fertility and promotes sustainable agriculture. Moreover, the aim of the present work focuses on exploring various efficient PSBs showing significance in the lowering down of heavy metal soil pollution, making unavailable forms of phosphorous to bioavailable form that can boost growth and yield of different plant species.

**Keywords:** Phosphorus; PSB; rhizosphere, Macroelement; Heavy metal



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## PP-37

## CHARACTERIZATION AND SYNTHESIS OF SILVER NANOPARTICLES BY BACILLUS SP. AND THEIR ANTIBACTERIAL PROPERTY

**Charu Gupta1 and Mahendra K. Gupta2**
1Microbiology lab., School of Studies in Microbiology, Jiwaji University, Gwalior (M.P)-474011, India
2School of studies in Botany, Jiwaji University, Gwalior (M.P)-474011, India

The application of microorganisms in the synthesis of nanoparticles emerges as an eco-friendly and burgeoning approach.From last few years, metal nanoparticles demonstrate a wide future prospects for various biomedical, bioremediation and biosensor applications because of their remarkable antibacterial, antioxidant, optical properties, large surface area to volume ratio and their higher efficacy. In the present study, a total of 9 bacterial isolates were obtained from sewage and identified as different species of bacillusand were employed for synthesising silver nanoparticles. Moreover, synthesized nanoparticles were characterized by UV-vis spectrophotometer and the maximum absorbance was found near about 400 nm. The particle size and lattice image of silver nanoparticles will be studied by Transmission Electron Microscopy (TEM). The further objective of this study is the treatment of waste water using these microbial synthesised silver nanoparticles. The antibacterial activity of these nanoparticles will also be tested against bacteria. Moreover, the isolated bacteria were also tested for heavy metal tolerance against different metal salts such as ZnSO4, CuSO4, CdCl2, Pb(NO3)2, HgCl2, K2Cr2O7, NiCl2, CoCl2, which has shown good results against these metals. Meanwhile, the current study emphasizes the use of these metal nanoparticles in the treatment of water and combating heavy metal pollution and their antibacterial activity. Further, the present study accentuates the recent milestones achieved on large scale production and future perspectives of nanoparticles.

**Keywords:** antibacterial activity, Silver nanoparticles, Heavy metals.

## PP-38

## ERUDITION OF SOME COMMON DISEASES AND RESOLVE SPIKE TO RECOGNIZE AND OVERCOME IT

**Sakshi Sherewar1 and Janvi Satpute2**
Sau. Vasudhatai Deshmukh College of Food Technology, Amravati.

A disease is a particular abnormal condition that adversely effect the functioning of body organs ,but not because of the external injury they are offend known to be medical conditions that are associated with specific symptoms and signs. Mainly disease are classified into two types communicable disease and non communicable disease but widely it is classified in to four types ,infectious diseases ,deficiency disease ,hereditary disease and physical disease. Some concept of disease is also explained as acquire disease, acute disease, chronic disease ,congenital disease, genetic disease, herediatery or

inherediatery disease, latrogenic disease, incurable disease ,primary disease, secondary disease, and so on..Here is integration of communicable disease and non-communicable disease with there symptoms to identify them as soon as. “Non-communicable disease”: The disease which is not transmissible directly from diseased person to normal person. Non-communicable disease is shortly known or can called as NCD .These disease are autoimmune disease. Stroke, most heart disease, most cancers, two types of diabetes, chronic kidney diseases, there are some non-communicable infectious diseases like parasitic diseases. Risk factors for non-communicable disease are persons background, lifestyle, and environment. The risk factors which includes the non-communicable disease are age, gender, genetics, exposure to pollute air, unhealthy diet, smoking and other physical inactivity that can lead to obesity and hypertension .There are also some environmental factors by which non-communicable diseases occurs like sunlight, nutrition choice, and other lifestyle habits .It cause diseases like cardiovascular diseases, lower back pain this cause due to lack of exercise in our daily routine. By the radiation of sun skin cancer and due to bad lifestyle obesity is increasing day by day in population. Inherited disease like down syndrome, cystic fibrosis, heterochromia. The major reason of causing non-communicable disease include tobacco, smoking, alcohol, poor diets, that is high consumption of sugar and salt saturated fats and physical inactivity. “Communicable disease”: Disease which are spread by infection causing agent are called as communicable diseases. There are various infectious agent such as bacteria, viruses, fungi or parasites. Communicable disease also spread through air, It occurs due to direct contact with a contaminated surface, food or beverages, blood or other body fluid sometimes infection by infected animals or insect is also capable of spreading the diseases. Caution, avoid sharing personal objects, get vaccinated cover your cough and sneeze with a tissue. Clean and disinfect disinfect frequently touched surface to kill germs, Washing hands e.t.c. Signs and symptoms of communicable disease, mild infection can may cures by resting and home remedies ,while some life threatening infections may need hospitalization. Every disease have its own symptoms but commonly occurring symptoms are; fever, diarrhea, fatigue, muscle aches, coughing. The above symptoms are lighter they can cure at home also but when bitten by any animal having trouble in breathing, experience arash, swelling, sudden vision problem then we have to see doctor. So identification of disease is primary and important step. From them we can overcome by some home remedies.

**Keywords:** Disease, non-communicable disease, communicable disease, causing agents.

## PP-39
## SEASONS: THE BIGGEST BOON

**Vaishnavi Sirsat1 and Kumar Chechare2**
Sau. Vasudhatai Deshmukh College of Food Technology, Amravati

Climate change and agriculture are interrelated processes, both of which take place on a global scale. Climate plays an important role in agricultural produce. Largest Economic impact of climatic affects agriculture. Agricultural produce requires suitable climatic conditions. Climate change occurs when changes in Earth’s climate system result in new weather patterns that remain in place for an extended





period of time. Different regions face different climatic changes. Some regions observe positive impact of climatic changes while some observe adverse effects. Sudden changes in climate may also cause disturbance. Climate change can disrupt food availability and affect food quality. Despite technological advances, such as improved varieties, genetically modified organisms, and irrigation systems, weather is still a key factor in agricultural productivity, as well as soil properties and natural communities. The effect of climate on agriculture is related to variability in local climates rather than in global climate patterns. Changes in average temperatures; rainfall; climate extremes; changes in atmosphere include climatic changes. CSA (Climate Smart Agriculture) has become very important in some areas. We have studied types of climates and Agricultural production needing suitable climatic conditions. Also, Agriculture contributes to climate change both by anthropogenic emissions of greenhouse gases and by the conversion of non-agricultural land such as forests into agricultural land. India is home to an extraordinary variety of climatic regions, ranging from tropical in the south to temperate and alpine in Himalayan north; where elevated regions receive sustained winter snowfall. The nation’s climate is strongly influenced by Himalayas and the The Thar Desert. Most of northeast India and much of North India experience hot summers, temperatures during the coldest months may fall as low as 0°C . Due to ample monsoon rains; India has only one subtype of that climate. The central states have suitable climate for all types of crops. 5 Seasons are experienced in Central India:- Winter season, Summer season, Rainy season, Autumn, Spring. Maharashtra has typical monsoon climate, with hot, rainy and cold weather seasons. Tropical conditions prevail all over the state and even the hill stations are not that cold. Dew, frost, hail can also be happened sometimes according to seasonal weather. The onset of the monsoons in early June gives relief to the scorching summers from month of march. The climatic conditions become cold from October end. Rainfall plays a very important role in the lives of people who are involved in agriculture. Most of the rainfall is received by Kokan and Sahyadrian parts of Maharashtra. We can see a great diversity of crops in Maharashtra due to change in seasons. These changes in climate plays important role in Maharashtrian agriculture. On this offset of seasons Maharashtrian farmers can grow variety of crops.

**Keywords:** Agriculture, Climates, Seasons

## PP-40
## CREATING COGNIZANCE AMONG THE TRIBAL PEOPLE FOR USING RESOURCES OF THEIR OWN AREAS TO FIGHT MALNUTRITION

**Sakshi Bang1 and Rushi Panajkar2**
Sau. Vasudhatai Deshmukh College of Food Technology, Amravati

We live in a country like India where there are many Tribal regions with lot of population. But these people do not get the proper education related to health, hygiene, food, etc. Due to lack f education these people cannot overcome the health related problems. And they suffer from malnutrition which is reason for various health problems and diseases. As we can say there are many people and children are suffering from malnutrition in India. When the body is unable to get the proper diet and

healthy foodstuff that condition of body is termed as Malnutrition. Malnutrition is responsible for various diseases like diarrhoea, stomach ache, chronic illness, HIV/AIDS, parasite infections, etc. The reason for malnutrition is poor sanitation, unsafe drinking water, living in unhygienic conditions and most important diet. These people do not follow healthy diet. The regions which are suffering from malnutrition in India are Subarnapur, Cuttack, Chamoli, Tikamgarh, Melghat, Chambal, etc. Malnutrition among the Tribal region is an important concern for the health authorities of India. To overcome this problem of malnutrition we can help them in their way by using cost efficient treatment to them. The medicinal plants which are available in their can be used by them in their day to day cooking. In Tribal region we can get many plants with lot of benefits and also with medicinal uses. For example, Moringa leaves which are good source of protein and vitamin can be used in a a powder form by adding them in the chapatti flour. Adhatoda vasica commonly known as Adulsa or Malabar nut. The leaves of this plant are crushed and the extracted juice can be used for cough and cold. Likewise there are many different plants which can be used as medicines on different diseases. To spread the awareness of these plants government should take the gatherings and educate them about different plants. Different NGO's can also take the initiative to educate the people for different plants and the diseases for which it is used. Which part of the plant can be used in what manner can be taught to them, i.e. in some cases only fruit can be used in the form of vegetable or salad. Along with this they can also teach the people about the living style, hygienic conditions. The precautions should be taken while cooking, medical precautions. Government can also help them by giving them demo lectures about different medicinal plants.

**Keywords:** Malnutrition, Medicinal plants, Tribal regions

## PP-41

## DRUG RESISTANT TUBERCULOSIS: CHALLENGES, PROGRESS AND THE END STRATEGY IN INDIA

**Dhananjay Kashyap**
School Of Sciences (SOS), ITM University, Gwalior, MP
djkashyap223@gmail.com

Tuberculosis (TB) is an ancient disease caused by Mycobacterium tuberculosis that usually affects the lungs, leading to severe coughing, fever, and chest pains. It emerged about 70,000 years ago as a genetic bottleneck and spread globally by clonal expansion. TB is curable and preventive but it kills around half a million people of India every year. TB is a communicable disease that is the major cause of ill health, one of the most leading cause of death from a single infectious agent. Drug Resistant Tuberculosis (DR-TB) is a substantial problem and India has the most number of cases of Multiple Drug Resistant (MDR-TB) in the world. Key challenges of TB in India are Missing TB Patients, Identification of DR-TB patients, Hospitals and Laboratory capacity. The estimated Burden of TB in India is 2,840,000 (1,470,000-4,650,000), since India is contributing one fourth of Global Burden. Government of India has made significant contribution to eliminate TB. Government is setting higher goals, investing more, using new tools and developing newer drugs. Case study of DR-TB in Sahara tribes of Central India, shows that MDR-TB rate was 2.2% of new cases and 8.2%among the previously treated cases in Gwalior while it was 2% previous cases in Shivpuri. RNTCP takes action in three phases and regulation of newer TB drugs in India. The End Strategy in India, millions of people have been treated under the National RNTCP program. There are the Three Pillars according to WHO to eradicate TB from World. Government of India is translating commitments into action. India's DOTS (directly observed treatment-short course) program is the fastest-expanding and the largest program in the world in terms of patients initiated on treatment and the second largest in terms of population coverage. In this review article, data available at the official websites of WHO; and from the Ministry of Health, Government of India, were consulted, and search engines PubMed® and Google Scholar® were used.

**Keywords:** Tuberculosis, DR-TB, Saharia Tribe, DOTS, End Strategy

## PP-42

## OPTIMIZATION OF FORMULATION AND NUTRITIONAL VALUE OF BESAN BURFI FORTIFIED WITH MUSHROOM POWDER

**Gauri Deshmukh**
Sau. Vasudhatai Deshmukh College of food technology, Amravati
fruity1123@rediffmail.com

Nowadays mushroom is more popular all over the world. Mushroom is used in manycuisines and it is called as 'meat' of the vegetable world. Mushroom is low calorie food and highly nutritive food which having good qualityproteins, minerals and vitamins. It is a natural source of foods and medicines. Mushrooms are rich in B vitamins, riboflavin, niacin and pantothenic acid. Its combination helps to protect the heart health. Mushrooms can prevent and treat many diseases and boost overall health, as well as help heal the planet. Mushroom as a source of biological active compounds of medicinal value including anti-viral, antitumor, anti-cancer, immuno potentiating and hypocholesterolaemic agents. It is the ideal food for diabetic patient and obese person because it having high fiber and low fat. The present study was undertaken to determine the nutritional value of mushroom powder fortified besan burfi. The burfi were prepared by the fortification of mushroom powder at different level such as 4%, 8%, 12%, 18% and 20%. The prepared burfi were analyzed for physic-chemical properties, organoleptic evaluation and nutritive value of besan burfi. The result revealed that 20% fortification of mushroom powder besan burfi contain high amount of protein, fiber, low fat and carbohydrate than control sample. It was highly acceptable in terms of sensory evaluation and nutritive value.

**Keywords:** Mushroom, nutritive value, sensory evaluation.

## PP-43

## VERMICOMPOSTING: A BETTER OPTION FOR FOR SUSTAINABLE RUMINANT MANURE MANAGEMENT

**Gazie Muzaffer Shah1 and Sameer Ahmad Thoker2**
1 School of Studies in Zoology, Jiwaji University Gwalior
2School of Studies in Botany, Jiwaji University Gwalior
gaziegeyo@gmail.com

Vermicomposting is a type of composting in which certain species of earthworms are used to enhance the process of organic waste conversion and produce a better end-product. It is a mesophilic process utilizing microorganisms and earthworms. Earthworms feeds the organic waste materials and passes it through their digestive system and gives out in a granular form (cocoons) which is known as vermicompost. The conventional aerobic and physicochemical treatment processes adopted for treatment of municipal and industrial wastewater in the developed countries have sparse chances of success in developing countries due to high energy requirements, operation and maintenance costs, and constraints in stable maintenance. Thus, it has become imperative to resort to simpler alternative technologies which are natural, less mechanized and simpler in operation and maintenance. The concept of using earthworms for waste processing is not a new one. The vermicompost produced can be of significant value to the end users like farmers for replacement of chemical fertilizers and procuring better prices for the organic produce using such composting material locally available at much lower cost. Vermicompost also benefits the environment by reducing the need for chemical fertilizers and decreasing the amount of waste going to landfills. Vermicompost may be sold in bulk or bagged with a variety of compost and soil blends. Markets include home improvement centers, nurseries, landscape contractors, greenhouses, garden supply stores, grocery chains, flower shops, discount houses, and the general public. Vermicomposts are excellent sources of biofertiliser and their addition improves the physiochemical and biological properties of agricultural soils. In addition, earthworms from the vermicomposting can be used as source of protein to fishes and monogastric animals. Vermicompost can also be used as raw materials for bioindustries.

**Keywords:** Vermitechnology, Earthworm, Compost and Vermicast.

## PP-44

## ABIOTIC STRESS TOLERANT BACILLUS STRAINS CONFER PLANT GROWTH PROMOTION AND ALKALINE STRESS AMELIORATION IN ZEA MAYS

**Vijay Kant Dixita,b, Sankalp Misraa, Shashank Kumar Mishraa, Swapnil Pandeya, Shri Krishna Tewaria, Namita Joshib, Puneet Singh Chauhana***
aCSIR- National Botanical Research Institute, Rana Pratap Marg, Lucknow 226 001, India
bDepartment of Environmental Science, Kanya Gurukul Campus, Gurukul Kangri University, Haridwar, 249404, India





puneetnbri@gmail.com, puneet@nbri.res.in

The present study designed to isolate and characterize alkaline stress-tolerant and plant growth-promoting bacterial strains from moderately alkaline soil (MAS; pH 8-9), strongly alkaline soil (SAS; pH 9-10), and very strongly alkaline soil (VSAS; >10). In this study, total 68 bacterial strains were isolated, and screened for multiple plant growth promoting (PGP) attributes. Further, 42 isolates exhibiting at least three PGP traits selected and out of 42, 15 bacterial isolates were selected based on enhanced maize plant growth under normal control condition. These 15 PGPR strains were then identified by 16S rRNA gene sequencing which revealed Bacillus spp. as a dominant genus. On the basis of improved seed germination percentage and biomass of maize (Zea mays L.) under alkaline stress conditions, NBRI, NB2.5 (Alcaligenes faecalis), NBRI YE1.3 (Bacillus subtilis), and NBRI YN4.4 (Bacillus aryabhattai) were selected, and further assessed for growth-promotion and alkaline stress amelioration under greenhouse condition. In the present study, NBRI YN4.4 significantly improved the photosynthetic parameters and soluble sugar content, and decreased proline level in maize plants in comparison to uninoculated control under alkaline stress conditions. Moreover, NBRI YN4.4 significantly enhanced soil enzymes such as dehydrogenase, alkaline phosphatase and betaglucosidase in maize rhizosphere in alkaline soil hence improving the soil health. Therefore, alkaline stress-tolerant PGPR NBRI YN4.4 can be beneficial for developing bio-inoculant for the reclamation of degraded soils as well as for improving the plant growth and soil health.

**Keywords:** Bacillus, PGPR, Alkalinity, 16S rRNA, Rhizosphere

## PP-45

## EFFECTIVENESS OF TWO INSECTICIDES AGAINST BRASSICA CAMPESTRIS APHID UNDER FIELD CONDITION

**Suneeta Dadoria* and R.K. Khare**
Govt. Model Science college, Gwalior, (M.P.)
asthaa123@gmail.com

The importance of two insecticides Metasystox-R 25EC and Dimethion 40EC applied against Brassica campestris aphid. The Brassica campestris plants were sprayed with the insecticides at 0.05%, and 0.025% at 50 and 70 days after sowing. The mortality of Brassica campestris aphid was assessed at 1, 5 and 10 days after first and second spraying of insecticides. Metasystox-R showed the most effectiveness among the two insecticides causing the highest mortality of Brassica campestris aphid followed by Dimethion 40EC. The mustard aphid occurs in the field from December to February both the adult and nymphs of this aphid caused damage to mustard plants from seedling to maturity, maximum damage is caused at flowering stage.

**PP-46**

## A REVIEW ON RAIN WATER HARVESTING

**Namita Saxena**
Department of Chemistry, RJIT BSF Academy Tekanpur, Gwalior MP- 474005
nam_saxena26@yahoo.com

Rain water harvesting is one of the most effective method of water conservation and water management. It is a simple process or technology used to conserve rain water by collecting, storing, conveying and purifying of rain water that run offs from rooftop, parks, roads open ground etc. for later use. Capturing the rain water help recharge local aquifers, reduce urban flooding and most importantly ensure water availability in water scarce zone. Rain water harvesting is a sustainable way of water conservation; such water can be used throughout the year for all basic needs. India is practicing rain water harvesting since 10th century. In 11th century largest rain water harvesting was done by Chola King. Now Government of India has decided to make rain water harvesting (RWH) compulsory in urban areas, considering increasing population and burden on water supply. In this review article, the need, process of RHW, it's component, methods, advantages and disadvantages will be discussed.

**Keywords:** Rain water harvesting, runoff, catchment area, surface water, rooftop

**PP-47**

## IMPACT OF MERCURY ON SUSTAINABLE ENVIRONMENT

**Yuvraj Singh, Pradeep Kashyap, Ekta Khare**
1School of pharmacy, I.T.M. University, Gwalior (M.P.), India

Heavy metals describe as any metallic chemical element that has a high density and is poisonous at lower concentration. Heavy metals include arsenic, lead, copper and mercury which mainly effects reproductive system and especially poisonous to growing fetus. These heavy metals are not filtered by placenta from mother to child and are straight deposit in growing fetal tissue. Women under the influence of toxic metals may be infertile, wildly irregular hormone level. Their unborn children receive heavy metals from their pregnant mother. This paper provides an overview of the current knowledge of toxic effect of metal during pregnancy and to newly born baby.

**Keywords:** Heavy metal, Mercury, Mercurous, Environment, Impact





**PP-48**

## CLIMATE CHANGE & DISASTER RISK IN INDIA: SOME ISSUES AND CHALLENGES

**Jagbir Singh and Anand Pal**
Dept. of Geography, Swami Shraddhanand College, University of Delhi, India
drjagbirs@gmail.com

"Climate change, a global phenomenon, calls for a collective response in the form of global partnerships" (UNDP, 2007c).Climate change and disasters are fast emerging as the most defining challenges of the 21st century as global risks with impacts far beyond just the environment and implications on national security and development. It is evident that climate change is a silent disaster with enormous damaging potential and causing disastrous implications in the atmosphere. Climate change may result from events such as changes in the Earth's orbit around the sun, earth's tilt, El Nino, La Nina, burning fossil fuels, Greenhouse effect, deforestation, urbanization, desertification, volcanic eruption, flood, forest fire, storms, surges ocean circulation etc. Two thirds of the disasters the South Asian region experiences are of climate related and there have been phenomenal increase in their frequency, severity and unpredictability in the recent times. The societal vulnerabilities are aggravating from stresses on water availability, agriculture and environment. With climate sensitive agrarian economies, climate change mitigation and adaptation are among the common priorities along with the disaster risk reduction in India. The integration of the climate change mitigation/ adaptation efforts with disaster risk reduction is therefore quite crucial. Although, efforts to bring together stakeholders in climate change and disaster management have begun to create an opportunity for integration, challenges however lie not only in harmonizing diverse institutional structures, distinct sectoral planning & policies etc but also in communication between the communities of practice at global, regional and national levels. A range of options and strategies to deal with disaster risk reduction and climate risk reduction are viewed from a 'risk management' approach. Ensuring that development planning processes integrate climate risks as well as disaster risks will require 'risk identification', i.e. bringing together and effectively disseminating information on vulnerability and hazards. Translating the macro level options into courses of action at the micro local level poses a complex challenge and will require a range of risk reduction and risk spreading options micro-scoped to the regional/local context. The recent years have just seen a beginning of this trend indicating the communities of climate change and disaster management talking to each other and coming closer, the integration however continues to be a challenge in India For India, tackling the challenge of climate change and increasing in disaster risks posits particular significance, presently poised as she is in an upward development trajectory. Valuable time and resources would be consumed in handling the increasing risks, which would impinge on its development, unless appropriate mitigation measures and mechanisms are not put in place now, and policies redefined to address the challenge.

**Keywords:** Atmosphere, Disaster Management, Opportunity, Planning & Policies.

## PP-49

## ANALYSIS OF CROCUS SATIVUS (SAFFRON) IN THE PREVENTION OF CYSTIC FOLLICLES AND ADENOMYOSIS IN RATS

**Haroon Bashir Zargar**
Sri Satya Sai University of Technology and Medical Sciences, Sehore (M.P.) 466001
haroonzargar24@gmail.com

To evaluate the antifertility activity of Crocus Sativus on female rats. The plant extract was tested for its effect on implant formation at two dose levels, 300 and 600 mg·kg−1, respectively. The effective methanolic plant extract was further studied for estrogenic potency on ovariectomised immature female rats. The data presented in this study demonstrate the antifertility potential of Crocus Sativus methanolic extract, which shows a strong and significant decrease in implant formation (100%), and a strong estrogenic effect resulting in a significant increase in uterine weight in immature ovariectomised rats. These observations suggest that the methanolic extract of Crocus Sativus has strong anti-implantation activity and estrogenic activity. The methanolic plant extract of Crocus Sativus has antifertility activity.

**Keywords:** Crocus Sativus; Cystic follicles; Adenomyosis; Antifertility.

## PP- 50

## SYNTHESIS OF ZNO@CDS HEXAGONS BY HYDROTHERMAL ROUTE AND THEIR PHOTOCATALYTIC CHARACTERIZATIONS

**Jyoti Bala1, Ramanand Bisauriya2, RK .Tiwari1 and Y C Goswami*2**
Nano Research lab, School of Sciences, ITM University Gwalior MP INDIA 474001
kaundal.jyoti@gmail.com, ycgoswami@gamil.com, r.bisauriya@gmail.com.

A simple hydrothermal process is developed for preparing ZnO@CdS nano-hexagons. Structural, morphological and phase information were determined by X-Ray diffraction (XRD), Transmission electron microscope (TEM) techniques and Field Emission Scanning Electron Microscope (FESEM). XRD results showed diffractions of wurtzite zinc oxide and wurtzite cadmium sulfide shell. FESEM results showed that nanoparticles are nearly hexagonal with an average diameter of about 17nm. There is regular decrease in size and structures increases as shown in FESEM. Optical properties and band gap were obtained from room temperature UV-visible spectroscope and photoluminescence spectroscopy. The crystallite size evaluated using XRD data matches well in agreement with size obtained from TEM measurements. The excellent optical properties make them suitable for optoelectronic applications and effective charge separation.

**Keywords:** Hydrothermal; Nano-hexagons; X-ray diffraction, Photoluminescence



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## PP-51

## STANDARDIZATION OF PROCESSING AND STORAGE TECHNIQUES OF CELASTRUSPANICULATUSWILD.(MALKANGNI) SEEDSFOR LIVELIHOOD IMPROVEMENT

**Hari Om Saxena*, Ganesh Pawar, Ruchi Sen and Abhilasha Thakur**
NTFP Discipline, Silviculture, Forest Management and Agroforestry Division,
Tropical Forest Research Institute, Jabalpur (M.P.) – 482021, India
hariomsaxena81@gmail.com

The present study was carried out to standardize the post harvesting practices (drying, processing, suitable containers, storage duration) of Celastruspaniculatus seeds in terms of oil content which revealed the sun drying better in comparison to shade and oven drying to maintain quality of seeds. It is also recommended to wash the seeds in water before storage to remove the outer pulpy layer on the seeds which allows the infestation of saw-toothed grain beetle (Oryzaephilussurnemensis Linn.). Moreover, high density polythene (HDPE) bags, 4-5oC andduration of six months were found optimum for storage of Malkangni seeds in term of oil content.

**Keywords:** Celastruspaniculatus, seeds, processing, storage,oil content

## PP-52

## IMPACT ON HUMAN HEALTH AND ENVIRONMENT BY THE CLIMATE CHANGE

**Namita Saxena**
Dept of Chemistry, RJIT Tekanpur Gwalior
nam_saxena21@yahoo.com

Climate change is a universal and continued phenomenon now a days. The pace of the change has however become faster in the last few decades. It has brought severe and possibly permanent alterations to our planet's geological, biological and ecological systems. The effects of climate change are being felt on all over the world and these impacts are predicted to intensify in the coming decades. These changes have led to the emergence of large scale environmental hazards to human health, such as extreme weather, ozone depletion, loss of biodiversity, stresses to food producing systems and the global spread of infectious diseases. Climate change is likely to threaten all life forms on earth. The environment also influences the health of people in many ways, through exposures to various physical, chemical and biological risk factors. According to the intergovernmental panel on climate change (IPCC), the climate change refers to only change in climate over time, whether due to natural variability or as a result of human activity. This review aims to provide the relationship between climate change and its impact on human health and environment.

**Keywords:** climate change, health effects, global warming, environmental hazards, ozone depletion, airborne diseases, waterborne diseases

## PP-53
## PHYSICOCHEMICAL PARAMETERS OF WINE PRODUCED FROM BANANA AND WHEAT

**Neha Chauhan Surbhi Antarkar and Rita Sharma**
School of Sciences, ITM University Gwalior

The aim of this present experiment was to study different physicochemical parameters of Banana and Wheat wine.Wine is a fermented product of originally grape fruit juice can be developed from other fruit juices as well. Ripened banana fruit is a good source of sugar, it contains 91 % sugar and 8%.Wheat is also added to banana fruit juice as a starch source which can be converted in to sugars..Banana must was prepared from banana fruit by treating juice with pectinase enzyme, diluting with water, ameliorating to 20 °Brix using sucrose and adding potassium metabisulfite. Then the pH of the must was adjusted as required. It was then subjected to pasteurization. The must was inoculated with yeast inoculum at 2 % (Saccharomyces cerivisiae is added for fermentation) concentration. Soluble solid and pH profile of the wine was monitored daily. After fermentation physicochemical parameters and final alcohol content of wine was evaluated.

**Keywords:** Wine,Banana ,Wheat,Physicochemical parameters.

## PP-54
## ACTIVE FOOD PACKAGING WITH SILVER AND ZINC NANOPARTICLES

**Surbhi Antarkar Neha Chauhan and Varsha Chauhan**
School of Sciences, ITM University Gwalior

Packaging of food is an essential part of processing, not just to improve the acceptability of product but to minimize the exposure of external environmental factors. The use of Active packaging is an innovative concept to modify packages which eventually improves the shelf life of food. In last few decades the increased demand of “ready to eat” food has lead to the innovation of food packages. Incorporation of nanomaterials including metallic as active fillers are highly affective. Cellulose-based materials such as hydroxypropyl methylcellulose (HPMC), carboxymethyl cellulose (CMC) are being widely used as basic packaging materials. They offer advantages including edibility, biocompatibility, barrier properties, attractive appearance, non-toxicity, non-polluting and low cost. Studies have proven that the nanoparticles of silver (AgNPs) and zinc oxide (Zno) have antimicrobial, anti-fungi and anti-yeast properties which can be combined with biodegradable and edible packaging materials to prevent spoilage of food.It has been accepted that these nanoparticles are affective against Escherichia coli(E. coli )and Staphylococcus aureus (S.aureus).

**Keywords:** Active packaging, Silver and Zinc nanoparticles, cellulose based packages.



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## PP-55
## ESTIMATION OF BACOPA MONNIERI (BRAHMI) IN ANTI AGEING AND EFFECTIVENESS IN VARIOUS ILLNESSES

**Neeraj Yadav**
Dr Krishna Gopal Dwivedi Ayurvedic Medical College and Hospital, Jhansi, U.P.
121neraj@gmail.com

Globally Bacopa monnieri is found in tropic and sub tropic regions such as India, Sri Lanka, Pakistan, China and Nepal. B. monnieri has been used for centuries to fortify the brain, cleanse the body and even improve communion with the divine. It is measured to be one of the mainly vital nervines in all of Ayurvedic medication. B. monnieri actions within both conventional and contemporary Ayurvedic herbalism such as, medhya, rasayana, nervine tonic, nervine sedative, analgesic, diuretic and purgative etc. While the rishis of yore may not have used the same terminology we do today, they also located immense significance on B. monnieri capability to improve the performance of both the body and brain. An experiment preformed in 2014 examined whether B. monnieri could be functional in the action of Attention Deficit Hyperactivity Disorder (ADHD) in children between the ages of 6 and 12. The contributors were agreed a dosage of 225 mg per day over 6 months of a standardized extort of B. monnieri. The researchers found that the participants had significantly reduced subset scores of ADHD symptoms, except in social issue. Impatience was reduced in 93% of contributors, development in self control was found in 89%, and signs of attention deficit were reduced in 85% of children. In addition, symptoms of learning trouble, impulsivity, and psychiatric problems were all found to be reduced in significant fraction of the test group. It should also be noted that the standardized extract was well tolerated by all of the children. The damaging outcome of neuronal cell death due to oxidative anxiety and mitochondrial dysfunction has been concerned in age allied cognitive and neurodegenerative disorders for instance “Alzheimer’s disease”. The B. monnieri is a dietetic antioxidant, with living thing and in vitro learning signifying numerous forms of acts that may defend the mind against oxidative injure.

**Keywords:** Bacopa monnieri, Ayurvedic Medications, Anti Ageing, Alzheimer’s disease, ADHD,

## PP-56
## THE PHYTOCHEMISTRY AND MEDICINAL IMPORTANCE OF PSIDIUM GUAJAVA (GUAVA)

**1Ankur Sharma, 2 Prachi Dixit**
1School of Agriculture, ITM University Gwalior, M.P.
2School of Science, ITM University Gwalior, M.P.
prachidixit949@gmail.com

Psidium guajava (guava) is well known tropic tree which is profusely grown for fruit. Many countries

including India, have a long history of using guava for medicinal and therapeutic purposes. This plant finds applications for the cure of diarrhea, dysentery, gastroenteritis, hypertension, diabetes, caries and pain relief and for enhancement in locomotors harmonization. Leaf extract of guava is being used as a medicine in cough, diarrhea, and oral ulcers and in some swollen gums wound. It's fruit is rich in vitamins A, C, iron, phosphorus and calcium and minerals. It contains high amount of organic and inorganic compounds like secondary metabolites e.g. antioxidants, polyphenols, antiviral compounds, anti-inflammatory compounds. Guava leaves contain several compounds that act as fungistatic and bacteriostatic agents. Guava has a high amount of important antioxidants and has radio-protective ability. Quercetin is well thought-out as most active antioxidant in the guava leaves and is responsible for its spasmolytic activity. The phenolic compounds in guava be of assistance to cure cancerous cells and prevent skin aging before time. The presence of terpenes, caryophyllene oxide and p-selinene in guava produces relaxation effects. Its ethyl-acetate take out the germ infection and thymus production. It possesses anti-viral, anti-inflammatory, anti-plaque and anti-mutagenic activities. Guava extract shows antinociceptive activity and is also effective in liver damage, tenderness and serum production. According to the research it is found that ethanolic extract of guava may increase the sperm quality as well as quantity and can be used for the treatment of infertile males.

**Keywords:** Anti-inflammatory, Psidium guajava , Quercetin, diarrhea, p-selinene

## PP-57
## ANTIOXIDANT AND HUMAN HEALTH

**Rita Sharma* and Neha Chauhan**
School of Life Science, ITM University Gwalior (M.P)
rita_sharma53@yahoo.com

Human diet has always been associated with health and diseases. Human diet including, vegetables, fruits, nuts, and other animal sources has rich sources of antioxidants and other bioactive molecules. Maximum part of the human diet derived from plant sources, which contains polyphenols including phenolic acids and flavonoids upto 90 %, and most of them possess antioxidant activity. Antioxidants terminate ROS attacks and appear to be of primary importance in the prevention of several degenerative diseases including cardiovascular diseases (CVDs), kidney disease, cancer, diabetes, obesity neurological disorders and aging. Free radicals are waste products produced by cells as the body processes food and interacts to the environment. Incomplete processing and removal of free radicals results into oxidative stress. This can lead to the cell disruption and improper body functioning. Free radicals are also known as reactive oxygen species (ROS). Internal factors like inflammation while pollution, UV exposure, and cigarette smoke are the external factors which increases the production of free radicals. Thus, antioxidants are said to help neutralize free radicals in our bodies, and this is thought to boost overall health, immunity and body functions. Diet can significantly alter the overall health and quality of life and it has been widely accepted. Functional foods rich in antioxidants can be regarded as important aspects in order to minimize production of free radicals. Natural products



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from dietary components such as medicinal plants and Indian spices are known to possess antioxidant activity. Several newer and future approaches are designed like novel biomolecules, gene therapy to produce more antioxidants in the body, synthetic antioxidant enzymes, genetically engineered plant products with higher level of antioxidants and the use of antioxidant rich functional foods.

**Keywords:** antioxidants, biomolecules, free radicals and ROS.

## PP-58
## FOREST FIRE IN UTTARAKHAND, INDIA; A CASE STUDY OF ALMORA AND NAINITAL

**Shweta Rani**
Department of Zoology R. H. G. (P. G) College Kashipur, U. S. Nagar (Uttarakhand)
shwetaschoolar@gmail.com

Uttarakhand, a state full of Natural beauty, famous for its snow covered hills, rivers and forests with large number of wild fauna and flora. Every year Uttarakhand forest witnesses many incident of wildfire. Uttarakhand has 45.32% of its geographical area under forest cover and it is the only state having 33% of area under forest cover. Present study deals with analysis of forest fire in Almora and Nainital district from 2014 to 2019 in last 5 years. 297 incidents were recorded in nainital and 289 in almora in a single year (2016). Among these Nainital witnesses most of the fire incidents about 24% of the total reported fire incidents.

**Keywords:** Nainital, Almora, wildfire, forest of Uttarakhand

## PP-59
## EVALUATION OF PHENOLIC, FLAVONOID CONTENTS AND ANTIOXIDANT ACTIVITY IN LEAVES, STEM AND ROOTS OF SOLANUM INDICUM LINN.

**Mohan B.*and Kakkar A.**
Natural Products Laboratory, Department of Chemistry, Govt. Science College,
Jabalpur (M.P.) - 482001
brijmohan625@gmail.com

Solanum indicum L. is commonly known as Birhata or Badikateri or Indian night shade and belongs to the family Solanaceae. It is an erect under shrub of 0.30 to 1.8 m in height and found throughout warmer parts of India, Asia and Africa upto an elevation of 1.5 m (Hasan et al., 2013). The national demand of S. indicum is 500-1000 MT per annum. All plant parts viz. berries, leaves, roots, seeds and stem of this species have been utilized in traditional system of medicine and are useful in various

diseases such as bronchitis, asthma, dry cough, rhinitis, dysuria, leucoderma, sexual disorders, insomnia, cardiac weakness and pruritis. The species is among the ten medicinal plants whose roots are principally employed in preparation of Dashmularishta, a well-established ayurvedic drug used in the treatment of fatigue, oral sores and gynecological disorders. Dashmul formulation is also utilized in the preparation of more than hundred ayurvedic drugs. The present investigation deals with the evaluation of phenolic, flavonoid contents and antioxidant activity in leaves, stem and roots of Solanum indicum. Powdered samples of leaves, stem and roots were subjected to successive extraction with solvents of increasing polarities i.e. Ethanol, Water: Ethanol (Aqua- alcoholic) (20: 80) and Water (aqueous) using soxhlet apparatus. The results showed the maximum phenolic content (12.351±0.03%)in Aqua-alcoholic(80: 20) extract and maximum flavonoid content (38.658±0.05%) in ethanolic extract of leaves. For stem, both the maximum phenolic (11.750±0.02%) and flavonoid (2.040±0.03%) contents was found in Aqua- alcoholic(80: 20) extract. Similarly, the maximum phenolic (18.651±0.03%) and flavonoid (2.701±0.05%) contents was found in ethanolic extract of roots. The Aqua- alcoholic (80: 20) extracts for leaves and stem and ethanolic extract for roots was found to contain the maximum antioxidant activity.

**Keywords:** Solanum indicum, leaves, stem, roots, phenolic and flavonoid contents, antioxidant activity

## PP-60

## HYDROGEN GENERATION BY SOLAR-DRIVEN PHOTOCATALYSTS AS A FUTURE OF ENERGY APPLICATIONS

**Sangar Begzaad, Rahman Yousofi, Abdullah Faizi, UPS Gahlaut and Y C Goswami**
Nanoresearch lab, Department of Physics, School of Sciences, ITM University, Gwalior MP India 474001
sangar.begzaad@gmail.com

The concerns over diminishing resources and the environmental impact of burning fossil fuels have focused attention on the development of alternative and sustainable energy sources. As the need to find renewable and environmentally friendly energy solutions grows, the tendency is for these sources increase in the vehicle matrices, gradually. Hydrogen appears as a potential to alternative fossil fuels. Hydrogen is one of the most abundant elements on the planet and can be obtained from numerous renewable sources. To be used in fuel cell vehicles or in internal combustion engines, hydrogen needs to go through stages such as production, storage and distribution. During the last fifteen years, significant effort has been made to develop effective hydrogen production methods. Hydrogen as an energy carrier, primarily derived from water, can address issues of sustainability, environmental emissions, and energy security. In the present article, we concisely review photocatalytic hydrogen production as a clean energy solution to address challenges of climate change and environmental sustainability. The use of hydrogen as a fuel, when generated from water using semiconductor photocatalysts and driven by sunlight, is a sustainable alternative to fossil fuels. However there are any challenges in this field to develop. A review of hydrogen generation will be discussed in the presentation.

**Keywords:** photocatalysts, clean energy, climate change, fossil fuels.



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## PP-61

## BIOFABRICATION OF SILVER SULPHIDE NANOPARTICLES FROM CINNAMOMUM TAMALA LEAVES: A NEXT GENERATION ANTI-INFLAMMATORY AGENT

**Richa Kothari1*and Deepshikha Sharma2**
Department of Chemistry, School of sciences, ITM University Gwalior (M.P.) India-474005
richakothari70@gmail.com

Inflammation is a body response to fight against various infections, toxins and injuries. The inflammation could be acute or chronic. A few factors such as age, obesity, diet, low sex hormones, sleep disorders, cardiovascular disease and cancer are the root cause of inflammation. The aim of the present study was to biosynthesize silver sulphide nanoparticles with potential anti-inflammatory activity against standard acetylsalicylic acid (aspirin drug). Silver sulphide nanoparticles were fabricated using the sol-gel method by mixing of bay leaf extract in silver nitrate solution. The synthesised Ag2SNPS were then later characterised using UV-Visible spectroscopy, FT-IR, SEM, TEM, and XRD. Further evaluated for their anti-inflammatory activity via inhibition of protein- denaturation, protease inhibition assay and heat induced haemolysis method. The results obtained from TEM, SEM and XRD characterization showed that the particle size was below 100nm and of spherical shape. FTIR spectra analysis showed the presence of various biomolecules, which have a very significant role in capping and stabilising silver sulphide nanoparticles. The synthesised Ag 2 S NPs showed anti-inflammatory activity against standard drug acetylsalicylic acid. Using protein denaturation, protease inhibition assay and heat induced haemolysis method. The biosynthesised silver sulphide nano particles showed potent anti-inflammatory activity, thus the anti- inflammatory activity of synthesised silver sulphide nano particles could be used in several biomedical applications . This synthesis is cost effective, eco-friendly and promising candidate for applications in medicine and ointment preparation.

**Keywords:** Green synthesis, Silver sulphide nanoparticles, Spectroscopic characterization, Anti-inflammatory activity

## PP-62

## NYCTANTHES ARBOR-TRISTIS MEDIATED SILVER SULPHIDE NANO PARTICLES: SYNTHESIS, CHARACTERIZATION AND ANTI – INFLAMMATORY ACTIVITIES

**Richa Kothari*[1], Harleen Rathore[2], Akanksha Chaturvedi[2]**
Department of Chemistry, School of Sciences, ITM University, Gwalior (M.P)-474005, India
richakothari70@gmail.com

Silver sulphide nanoparticles (Ag2S) are engineered nanoparticles with promising applications in industrial processes and have been used in infrared sensors, Solar cells optical filters and biomedical

applications. Due to their low solubility $Ag_2SNPs$ have been shown to be less toxic than AgNPs and $Ag^+$ using aqueous extract of Nyctanthes- arbor- tristis leaves in the synthesis of silver sulphide nanoparticles is considered as green , eco friendly, low priced biotechnology that gives importance over both chemical and physical method . In the present study the aqueous extract of fresh leaves of N. arbor trist is extract was used for green synthesis of silver sulphide nano particles plays a dual in nature in both reducing and stabilizing Ag2SNPS. In UV-Visible absorption , Fourier transform (FI-IR), XRD, Transmission electron microscopy (TEM), EDX and Scanning electron microscopy (SEM) were achieved for confirming and characterizing the biosynthesized $Ag_2SNPs$ .TEM images of $Ag_2SNPs$ detected the spherical Ag2SNPS shape with diverse size range within 1.486-6.69 nm. FT-IR analysis demonstrated the presence of free amino groups in addition to sulphur containing amino acid derivative actives as stabilizing agent as well as the presence of either sulphur or phosphorous functional groups which possibly attaches silver. In this study , biosynthesized N-$Ag_2$ S NPs exhibited anti inflammatory activity against standard aspirin drug using protein denaturation, protease inhibition assay and heat induced haemolysis method as well as cytotoxic effects against skin cancer cell line A-431 cells gives IC5O (±0.11 µg/ml). Haemolytic activity of $Ag_2SNPs$ was investigated and confirm as being non-toxic to human RBCs in low concentration .

**Keywords:** Silver sulphide nano particles, Nyctanthes arbor-tristis leaves, Ecofriendly, anti inflammatory activity and haemolytic activity

## PP-63
## DYE SENSITIZED SOLAR CELLS: TOOL TO OVERCOME THE FUTURE ENERGY CRISIS

**Mohammad Taqi Qaeemy, Alpana Sharma, Maisam Zirak, Rajesh Sharma and Y C Goswami**
Nanoresearch lab, Department of Physics, School of Sciences, ITM University, Gwalior MP India 474001

There is an urgent need for alternative energy resources due to the rapid rise in the price of fossil fuels and fossil fuels are depleting as days progressing. Hence, there is a crucial requirement of sustainable energy resources like solar energy, which is considered as an eco-friendly and promising method to overcome this problem. Solar energy is an abundant natural resource and from many decades scientists have been trying to harness this energy for use in electricity. Therefore, the current solar- or photovoltaic-cell-based technologies, which can utilize solar energy, are of extreme importance. Dye-sensitized solar cells (DSSCs) are of particular interest because they can offer a number of advantages when compared to existing photovoltaic technologies. DSSC is promising renewable energy resource because of zero waste, low cost and eco-friendly and that can utilizes a sensitized dye to harvest sunlight. The dye plays important role to harvest solar energy and convert it to electrical energy. Dye-sensitized solar cells (DSSCs) are a promising third-generation photovoltaic technology due to their ease in fabrication, ability to operate in diffused light, flexibility, and lightweight. DSSC is a novel solution to overcome the future energy crisis.

**Keywords:** Dye-sensitized solar cells, eco-friendly, natural resource, photovoltaic technology



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## PP-64
## CONSEQUENCES OF EARTHQUAKE ON ENVIRONMENT-A STUDY

**Nishtha Sahu, Osheen Gupta**
Department of Civil Engineering, MMMUT Gorakhpur, Uttar Pradesh, India-273010

Earthquake is one of the most devastating activities which causes sudden movement of the earth's crust with the release of energy. Earthquakes adversely affect our environment and disturb our ecosystem. It causes pollution including water, air, and land pollution. Pollution due to various toxic, carcinogenic gases and chemicals released from damaged factories affecting public health, aquatic life and environment. It causes volcanic eruption, landslides, tsunamis and floods that destroyed the stability of our environment. An earthquake can invoke many sudden changes in the environment which can be classified as primary (surface faulting or uplift) and secondary effects (landslides, liquefaction, tsunami, and cracking of ground). Such types of effects are known as Earthquake Environmental Effects (EEE).In this paper, we have discussed the types of pollution which are caused due to earthquake, Earthquake Environmental Effects (EEE), earthquake resistant techniques that can be used to minimize the damage of structure, mitigation measures that can be taken for earthquake prevention and disaster reduction.

**Keywords:** Earthquake, environment, Pollution, Earthquake Environmental Effects (EEE), mitigation measures

## PP-65
## SUSTAINABLE STRUCTURE TO COMBAT EARTHQUAKE DAMAGE-AN OVERVIEW

**Nishtha Sahu, Shahrukh Ali, Osheen Gupta**
Department of Civil Engineering, MMMUT Gorakhpur, Uttar Pradesh, India-273010
sahunishtha0103@gmail.com, ishanausheen3@gmail.com, osheen2312@gmail.com

Over the last two decades, earthquakes across the world have adversely affected our environment and disturb our ecosystem. Earthquake is one of the major natural disasters which causes huge destruction and collapse of structures due to improper design against the seismic motion. The main objective is to design a structure in such a way that damage to the structures is minimized and to build safe, sustainable and resilient structures for future generations. Sustainable construction methods include judiciously using renewable and recyclable resources, consuming less energy in the life cycle process of materials being used, creating an environmentally friendly environment, protecting the natural environment. The principal objectives of this paper are to present a brief overview of an overall framework for sustainability and then to discuss innovative technology for seismic resistant structure design and construction. Scope, Scheme and technologies are presented to improve the sustainability of the environment.

**Keywords:** Earthquake, Sustainable technologies, Damage Control

## PP-66

## ASSESSMENT OF HAZARDOUS EFFECT AND SMART MANAGEMENT OF ELECTRONIC WASTE

**Seema Kodesia**
Department of Zoology, Bareilly College Campus MJP Rohilkhand University, Bareilly-243005, UP, India
kodesiad@yahoo.co.in

E-waste is a popular, informal name for electronic products nearing the end of their “useful life.” Computers, televisions, VCRs, stereos, copiers, and fax machines are common electronic products. Many of these products can be reused, refurbished, or recycled. The rapid revolution in technology affected our lifestyle drastically and led us to believe that our lives have changed for better. Now communication with our distant friends or relatives, buying branded products or goods on the go and conducting business meeting I possible with just a single click. But on the other side it also has major negative effects on our life-Elevated Exasperation, Deteriorated Patience, Declining Writing Skill, and Lack of Physical Interactivity. The worst negative side effect of rapidly developing electronics is Electronic or e-waste. It may be defined as discarded computers, office electronic equipment, entertainment device electronics, mobile phones, television sets, and refrigerators. This includes used electronics which are destined for reuse, resale, salvage, recycling, or disposal. Others are reusable (working and repairable electronics) and secondary scrap (copper, steel, plastic, etc.) to be “commodities”, and reserve the term “waste” for residue or material which is dumped by the buyer rather than recycled, including residue from reuse and recycling operations. Because loads of surplus electronics and frequently commingled (good, recyclable, and non-recyclable), several public policy advocates apply the term “e-waste” broadly to all surplus electronics. An estimated 50 million tons of e-waste are produced each year. The USA discards 30 million computers each year and 100 million phones are disposed of in Europe each year. The Environmental Protection Agency estimates that only 15-20% of e-waste is recycled, the rest of these electronics go directly to landfills and incinerators. According to a report – the amount of e-waste being produced including mobile phones and computers cold rise by as much as 500 percent over the next decade in some countries, such as India.

**Keywords:** Environment, Electronics, Elements, E-Wastes, Health hazards

## PP-67

## ANALYSIS OF PHYSICO-CHEMICAL PARAMETERS AND HEAVY METALS OF HASANPUR LAKE, GHAZIABAD, UTTAR PRADESH (INDIA)

**Amrita Singh1 and Rajendra Singh2**
1Department of Environmental Science, Bareilly College, Bareilly,UP,India.
2Department of Zoology, Bareilly College, Bareilly, UP, India.
amritasngh78@gmail.com





In developing countries like India, water bodies such as lakes are utilized for irrigation. Lakes serve as a source of water for sectors like agriculture, industries etc. which form backbone of Indian Economy. Due to ever increasing human population, developmental activities such as industrialization and modern agricultural practices, water quality in lakes has become a major concern. The present study was conducted with the objective to assess the water quality of the Hasanpur lake of Dhaulana Tehsil of Ghaziabad, Uttar Pradesh, which is biggest lake Northern India and spread across 240 acres, using physico-chemical parameters with heavy metals of the lake. For this study, five sampling stations were identified and samples were collected from different stationsin summer season. Important physico-chemical parameters including water temperature, pH, total hardness, dissolved oxygen (DO), chemical oxygen demand (COD), biological oxygen demand (BOD), total alkalinity, total dissolved solid (TDS) with heavy metals including lead (Pb), copper (Cu), cadmium (Cd), chromium (Cr) were analyzed. The results reflected the variation at different sampling stations for different physico-chemical parameters as well as heavy metal at Hasanpur Lake. These result reviled that water of lake was polluted in the form of nutrient enrichment which is due to agricultural activities and its runoff in and around catchment area of the lake. Further, pollutants in the lake may negatively affect the health of living beings, which may ultimately affect the biodiversity of lake. Therefore, the conservation and management of this lake is of immense importance.

**Keywords:** Lakes, Physico- chemical parameters, heavy metals, Pollutants

## PP-68

## FOLK PAINTINGS IN ENVIRONMENT CONSERVATION AND AWARENESS

**Mamta Singh and Manju Singh**
Department of Fine Arts
Bareilly College Campus, affiliated to MJP Rohilkhand University, Bareilly -243005, UP, India
manumamtamanan@gmail.com

The role of Indian Art is for existence and transmission of cultural heritage and moral values. It exists in all culture and Society. The historical overview of art reflects the impact of natural and socio-cultural environment from Prehistoric age till now. Folk paintings not only serve as “decoration” for beautifying people’s living environment but also have especial social and cultural properties that meet aesthetic needs of the public and possess functions for reflecting the ethnic, folk, and contemporary culture trend as well as functions for socio-cultural welfare purpose. Artistic creation Folk paintings in harmony with environment can enhance the art value, cultural value of environment and add its functions. Folk paintings of new era can also reproduce historical events, heroic deeds of historical figures, thus playing a role in narration. As people’s living standards have been improved and aesthetic demands have increased, Folk paintings begin to enter small space such as private houses and therefore decorative functions of Folk paintings, decorative functions of Folk paintings become increasingly obvious. Folk paintings evolved with human development and have been playing an irreplaceable role from the ancient to modern time. Ancient Folk paintings are effective tools for worship, preaching the

authority of the ruling class and maintaining the interests of the ruling elite, and its social functions of indoctrinating and promoting human relations have continued ever since. As the modern civilization develops, appreciation of aesthetic beauty has become more individualized, and as a result, Folk art tends to cater to the development needs of the micro-environment while maintaining its traditional educational functions, and decoration and interest have become new requirements for Folk paintings. Since Folk art works can contribute to improving the cultural environment or space environment, it will be expounded in this paper from three aspects, namely, social educational function, spatial decorative function and changing and value-added function.

**Keywords:** Folk painting, Environment, Education

## PP-69
## EFFECTOF SUGARMILLEFFLUENTSONSEED GERMINATIONOFPADDY, ORYZASATIVA L. IN WESTERN UTTAR PRADESH

**Hirdesh Kumar Yadav and Rajendra Singh**
Plant Parasite Research Lab., DepartmentofEnvironment Science
Bareilly College Campus, MJP Rohilkhand University, Bareilly-243005, UP, INDIA
yadavhirdesh.03@gmail.com

Wastewater from sugar industries is one that has complex characteristics and is considered a challenge for environmental engineers in terms of treatment as well as utilization. Before treatment and recycling, determination of physicochemical parameter is an important mechanism. Sugar mills play a major role in polluting the water bodies and land by discharging a large amount of Waste water as effluent. The sugar mill effluents are having high amount of suspended solids, dissolved solids, BOD, COD, chloride, sulphate, nitrates, calcium and magnesium. The continuous use of these effluents harmfully affects the crops when used for irrigation. In the present study, physico-chemical parameters of sugar mill effluent and contaminated soil was determined and the effect of various concentrations (0%, 10%, 25%, 50%, 75% and 100%) of the effluent on seed germination, germination speed of Paddy (OryzasativaL.) was also studied. The low effluent pH (4.20), total dissolved solids, (TDS, 1620 mg/L) and chemical oxygen demand, (COD, 3230 mg/L) indicate the high inorganic and organic content with an acidic load. Germination percentages and germination values decrease with increasing concentration of effluent in the seeds tested.

**Keywords:** Effluent, Sugar mill, Physico-chemical analysis, Seed germination, Oryza and Paddy.



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## PP-70
## STRUCTURAL AND OPTICAL CHARACTERIZATION OF SNO2/GO NANOCOMPOSITES GROWN BY CHEMICAL ROUTE

**Rajashree Mohapatra, Jyotibala Kaundal and Y C Goswami**
ITM University, Gwalior MP India

SnO2/grapheme oxide (SnO2:GO) composites have gained a lot of attention for their applications in innovative energy-related materials such as sensors, anode materials in lithium-ion batteries, and photocatalysts. The combination of a semiconductor with graphene oxide represents a feasible route to promote separation of photo generated charge carriers and increase their lifetime, owing to the charge-carrier mobility or electrical conductivity. In this paper we have reported SnO2–graphene composites synthesized by an ultrasonic sol gel route. The samples were synthesized by optical, structural and luminescence and FTIR studies. The powder X-ray diffraction (XRD) pattern of the SnO2/GO nano-nano composite exhibits that the peaks are in good agreement with reported data. The excellent optical properties make them suitable for optoelectronic applications and effective charge separation.

**Keywords:** photocatalysts, X-ray diffraction, luminescence, FTIR

## PP-71
## IMPACT OF THERMAL POLLUTION ON RIVERINE ECOSYSTEM OF SARYU RIVER

**Vivek Dixit1, Alok Pratap Singh1, Manoj Kumar Mishra1, Anand Pandey1, Kishun Bir2**
1Department of Chemistry, Kisan PG College, Bahraich, UP, India
2Department of Physics, Kisan PG College, Bahraich, UP, India

Thermal pollution due to power plants and other industries is observed as a major cause of interference in riverine ecosystem in recent years. Current study is done to quantify the effect of thermal pollution on the growth of flora, especially confined in the eastern zone of UttarPradesh. There was a significant decrease in number of phytoplankton which was observed parallel to the decrease in DO and dissolved CO2 level. In other larger hydrophytes there was significant decline in the biomass was observed. As per the current observation there is an emergent need to check the level of thermal pollution by pretreatment of thermal power plants and industries effluents to check the loss of biodiversity.

**Keywords:** thermal pollution, DO (dissolved oxygen), phytoplankton.

## PP-72

## COMPARATIVE STUDY OF BIOFERTILIZER AZOTOBACTOR ON THE PRODUCTION OF OKRA

**Mumtaz Husain**
Department of Botany, SS (P.G.) College, Shahjahanpur-242 001 U.P. (India)
husainmumtaz786786@gmail.com

A simple randomized pot experiment was conducted at G. F. College, Shahjahanpur during January to March-2011. Efficacy of various doses of nitrogen in combination with Azotobacter was studied on the nitrogen content of okra leaves. Two controls were set, one without nitrogen and Azotobacter and another without nitrogen with Azotobacter to compare the effect of Azotobacter alone and in combination with various nitrogen doses. The nitrogen was estimated in dry leaves at 15, 30 and 45 days after germination (DAG) stages. All the treatments of nitrogen and Azotobacter seed inoculation gave significantly higher nitrogen contents in the leaves of okra. The maximum nitrogen content was reported in okra leaves receiving N22.5 + Azotobacter. The minimum nitrogen content was reported in control (N0+B0) where no nitrogen and Azotobacter was applied. Therefore, it can be recommended that use of lower doses of nitrogen and Azotobacter seed inoculation improved the nitrogen content of leaves in okra plants which will enhanced the final yield of the crop. On the other hand, a large amount of nitrogen fertilizer is also saved thereby, decreasing the cost of production of crop.

**Keywords:** Azotobacter, Nitrogen, okra.

## PP-73

## COMPARATIVE DEVELOPMENTAL STUDIES OF SILK MOTH ON DIFFERENT VARIETIES OF MULBERRY

**Nidhi Tripathi**
Department of Zoology, SS (PG) College Shahjahanpur 242001 UP India
nidhitri66@gmail.com

To identify the food preference of silk moth (Bombyx mori Linnaeus), the leaves of five mulberry varieties belonging to AR-2, BR-2, K-2, S-1 and S-146 were provided as food to newly hatched silk worms in different rearing jars under similar laboratory conditions (25±1°C, 65±5 % and 12:12 L:D). The observations revealed a significant ($p < 0.01$, df = 4, 24) variations in different developmental stages of silk worm with respect to change food and the shortest incubation (7.90±0.123 days), shortest larval (3.10±0.078, 2.30±0.127, 3.20±0.114, 3.60±0.123 and 6.20±0.130 days on Ist, IInd, IIIrd, IVth and Vth instar, respectively), shortest pupal (4.80±0.071 and 8.00±0.114 days with respect to pre-pupal and pupal) period and longest adult (8.20±0.071 and 9.80±0.071 days on male and female, respectively) development was observed on S-146 variety of mulberry compare to AR-2, BR-2, K-2 and S-1. Similarly, the overall development showed preference in accordance to S-146 (48.10±0.327 days) followed by K-2 (51.66±0.346 days), AR-2 (53.00±0.200 days), BR-2 (55.00±0.212 days) and minimum to S-1 (55.10±0.300 days), respectively. The highest preference to mulberry variety of S-146 was noticed due to the smooth texture of leaves compare to other varieties.

**Keywords:** biology, silk worm, mulberry, food preference

## PP-74

## A TAXONOMIC STUDY FOCUSING ON THE ANGIOSPERMIC PLANTS IN MID-UTTARPRADESH REGION

**Ritu Srivastava, Nancy Gupta, Keshav Shukla* and Adarsh Pandey**
Department of Botany, SS PG College Shahjahanpur 242001 UP India
keshavshukla1689@gmail.com

District Shahjahanpur occupies the southest corner of Rohilkhanddivision and is located at 27.88°N 79.91°E. It has an average elevation of 194 metres (600 feet). It is situated at the junction of two rivers, namely Khannaut and Garra. The climate of district Shahjahanpur is generally defined to be tropical monsoon type. District Shahjahanpur is subdivide into three zones and samples of different variety of angiospermic plants were collected and about 30 plant spp. were identified, belonging to 18 families; collected plants were classified into two angiospermic categories dicot and monocot; among them dicot plant were found more likely in comparison to the monocots, and the family Euphorbiaceae found dominating among the studied angiosperm families. In this survey we have observed medicinal plants in excess in along with great variation in the flora at Shahjahanpur.

**Keywords:** Shahjahanpur, Flora, Angiosperm, Polypetalae,Khannaut and Garra.

## PP-75

## DEVELOPMENT OF A PHYTOREMEDIATION APPROACH TO REMOVE LEAD FROM SOIL

**Shikha Saxena**
Department of Botany, SS (PG) College Shahjahanpur 242001 UP India
drjauhari26@gmail.com

Phytoextraction involves specific plant species which can absorb and hyper accumulate metal contaminants and/or excess nutrients in harvestable root and shoot tissue, from the growth substrate (soil).The objective of present investigation is to examine the accumulation potential of lead in marigold.

The experiment was carried out with two varieties of marigold i.e. Pusa narangi and Ritu raj. The seeds of marigold of two varieties were presoaked in distilled water and were sown in the field without any treatment as control. After 20 days, the plantlets of marigold of both varieties were transplanted into the pots, supplied with different doses of Pb (50,100 and 200 mg/kg of soil) at 10,15, 25 and 30 days. The growth parameters were recorded at 25 and 45 days. The result of the present investigation clearly indicate that different concentration of Pb (50,100 and 200 mg/kg of soil) did not adversely affect the growth parameters of marigold in both varieties in terms of plant height, fresh and dry weight, chlorophyll, Carotenoid, carbohydrate, nitrogen and protein contents but some insignificant reduction were noticed in these parameters as compared to control, proline content insignificantly increased under the influence of different concentration of Pb at 25 days. At 45 days too,a insignificant reduction was noticed in these parameters and also the proline content was insignificantly increased as compared to 25 days old plants. The accumulation of Pb was found to be more in shoot than in the root. We have noticed that among both the varieties, Pusa narangi was found to be more resistant to metal toxicity and the accumulation potential of Pb was found to be more than in variety Ritu raj.So the marigold can be considered as a potential economic crop for phytoremediation of Pb contaminated sites.

**Keywords:** Marigold; Phytoextraction; Lead; Accumulation.

## PP-76
## EFFECT OF SYNTHETIC BRASSINOSTEROID ON SEED GERMINATION AND ANTIOXIDANT METABOLISM OF TOMATO (SOLANUMLYCOPERSICUM)

**Ganpat Chaudhary, Parvati Kad, Kinjal Solanki , Amit Verma and M.K.Chaudhary**
Department of Biochemistry, College of Basic Science & Humanities, SardarkrushinagarDantiwada Agricultural University, S K Nagar, Gujarat
gc64464@gmail.com

Brassino steroids (BRs) are new steroidal phytohormone which has various plant growth beneficial effects. Post its discovery by Mitchell and group, various BRs are discovered from natural sources and found to be affecting a broad range of processes like seed germination, stem elongation, cell division and expansion, xylem differentiation, plant growth, and apical dominance. Recently, these hormones are found to having additional role of exerting anti stress effects on plants such as those caused by heat, cold, drought, and salt along with its potential role in pathogen defense. In the present study, the effects of synthetic BRs were checked on seed germination of tomato and how it affect the antioxidant metabolite contents during germination and seedling development under the artificial PEG induced drought condition. Different concentrations of the BRs are tested for its effect on seed germination along with the variations in the metabolite content like sugars, ascorbate, proline, chlorophyll, phenols and flavonoids. Antioxidant enzymes viz. Superoxide dismutase, Peroxidase, Catalase activities are measured under treated and untreated conditions. BRs shows positive effects on the plant metabolism to tackle the PEG induced drought and supports the seed germination and development under this condition.

**Keywords:** Superoxide dismutase, BRs, Antioxidant enzymes, phytohormone



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## PP-77
## GENOME EDITING: AN OVERVIEW

**Deepshikha Sharma1, Laiba Arshi2, Saumya Dixit3 and Rita Sharma***
Department of Life Science, ITM University Gwalior (M.P)
rita_sharma53@yahoo.com

Now a day we have Smart TV's, smart phones and now the cities are even getting smart and soon it will be possible to technology. The cells of our body contain molecules of DNA, which carries all the information that are required for life and its damage due to various reasons should get repaired or replaced for life. It is an error prone process a small mistake can cause a totally changed sequence. The genome editing technology was first discovered in late 1900's. Frederick Sanger which is also known as Chain Termination method was modified into a new technique which is known as shotgun sequencing. In 2012 discovery of epigenetic editing takes place and Gene editing began with that. In April 2013 CRISPR system was firstly used on Zebra fish. Some of the techniques used for editing genome are Zink-Finger nucleus, TALENS's and CRISPR/Cas9. Zink-Finger technique was the first genome editing tool which lies on proteins. Scientists use molecular scissors to cut the DNA at a specific spot so that they can remove or replace the particular genome or DNA at that particular spot. CRISPR has made it easy to edit a specific genome. It is cheaper, faster, simpler and more accurate than the older techniques of genome editing and has several applications in agriculture and medical field.

**Keywords:** CRISPR, DNA, genome editing, Zink-Finger technique, Chain Termination method, Frederick Sanger

## PP-78
## COLOUR CHANGE IN FRESH WATER TELEOSTS FISHES AND MELENOPHORES REACTION TO CERTAIN CHEMICALS AND DRUGS

**Trapti Pathak**
School of Sciences, ITM University Gwalior
trapti.pathak@itmuniversity.ac.in

Fishes are shows camouflage according to their surroundings by change their body colour. They do so by either aggregating the melanosomes or by dispersing them within the skin. Sympathetic nerves regulate these movements with the help of cytoskeleton named microtubules and microfilaments. Employing the melanophores on isolated scales of the fingerling of teleost fish, it is attempted to characterise the concerned nerves and the receptors located on melenocytes along with implication of microtubules in the pigmentary translocation in the fish. The scales from dorso-lateral trunk of the fish represented the sympathetic–neuromelanophore preparations which were stimulated by chemical means, such as adrenergic agonist, antagonist and the microtubule-disrupting drug. Adrenaline is an adrenergic agonist which is strongly induced the dose-dependent concentration of

pigment in innervated melanophores while Yohimbine is an adrenergic antagonist which is known to block effectively the α2-adrenoceptors inhibited the action of adrenaline. Colchicine effectively interferes with melanosome aggregating action of adrenaline. From these results it is concluded that the chromatic fibres of adrenergic nature innervate the melanophores and these cells do possess α2-adrenoceptors which mediate the melanosome aggregation and the movements of pigment granules through microtubules means of transport within the cell. These movements of pigment are linked to paling or darkening achieved of teleost fish respectively when they approach to their background.

**Keywords:** Melenophore, colour change, agonist, antagonist, microtubule, melanosomes etc.

## PP-79
## FRESH WATER AVAILABILITY AND IT'S GLOBAL CHALLENGE

**R. K. Mishra1 and S.C. Dubey2**
1Department of Physics, A.P.S. Univ. Rewa (M.P.)
2Department of Physics, S.G.S. Govt. P.G. College, Sidhi (M.P.) Pin-486661, India.
Present address1 G.H.S.S. Kandel, Disst. Dhamatari (C.G.)
rakesh_response@rediffmail.com

Water is prime natural resources fulfilling our needs in a precious asset. We must acts to preserve and utilize every drop of water. water resources can be assessed on the basis of surface and subsurface water bodies. Climate change impact on ground Water the impact of climate change on ground water has been studied much less than the impact on surface waters. Ground water reacts to climate change mainly due to change in ground water recharge, but also change in river level in response to increase in mean Temperature, precipitation, variability and sea level as mean precipitations. Changing land use pattern due to increasing, urbanization, industrialization and agriculture activities are serious issues that causing increase ground water withdrawal resulting in depletion of ground water resources and mining of ground water resources, along with deterioration of water quality. Rainfall is highly irregular and erratic and declining year to year due to change climatic conditions as result of serious deforestation global warming etc. Human health is affected by change in biodiversity and ecosystem. Climate change will affect the quality of drinking water and impact of fresh water availability and impact on public health. About 70% of Earth's surface is water of which 97.5% is salty water and 2.5% is fresh water. Less than 1% of this 2.5% amount of freshwater is accessible. As sea water rise's , salt water of ocean in filtrate as coastal fresh water due heavy rainfall and flooding waste more fertilizer and municipal sewage mixed with costal fresh water and change alter into more oxygen dead zone. Weather extreme and climate variability is main driver of food production.

**Keywords:** climate change, fresh water, quality of water



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## PP- 80
## STUDIES ON THE COLOUR PATTERN OF A FRESH WATER FISH OPHIOCEPHALUS GACHUA (HAM)

**Adarsh Dixit**
Department of Zoology Govt. Science College, Gwalior (M.P.) India
adarshdixit1111@gmail.com

The present study is an effort to determine the differential distribution of chromatophores with regard to dark vertical bands and intervening areas and ventral body surface of the fish under normal background conditions. The study regarding colour pattern of the fish includes melanophores, xanthophores and leucophores in five different sites of the fish body .the different morphological types of melanophores were also studied, melanophores are found to be of different types and play an important role in the colour change of the fish .role of various types of melanophores has also been studied. For the present study the entire fish body surface was arbitrarily devided in to 3 major parts were further devided in to 5 sites on either side of the fish. The site 'A' represents the bands area of dorsal region and site 'c' represents the intervening area (area between two bands) site 'B' represents bands area below the latral line and site 'D' the intervening area and site 'E' who chosen for the study of ventral region (below site B & D). such a plan of study gave more accurate results regarding the variation in number, size and distribution of chromatophore in different sites of fish body. An interesting investigation; which has been made during the study is that the number of melanophores as well as xanthopheros line (the dorsal region including site 'C') than the band regine below the lateral line (i. e. lateral part of the body including site 'B'). But the presence of lesser number of melanophores and xanthophores in intervening area below later line (i.e. lateral part including site 'D') help in observing band and intervening area respectively. Thus the study proves that greater number of melanophores and xanthopheros but lesser number of leucophores present in band and intervening areas; above lateral line (i. e. the dorsal part). Unlike the site 'A' the lesser number of melanophores and xanthophores with high number of lenecophores were found in site 'B' and 'D' below the lateral line (i.e. lateral part). The region for this is that the number of melanophores and xanthophores are always greater with high pigment content in the dorsal part of the body, in comparison to lateral and ventral part. Thus site 'A' and 'C' has greater melanophores and xanthophores population than site 'B' and 'D' while site 'E' has smallest all the five sites of the fish body.

**Keywords:** melanophores, xanthophores, chromatophores, leucophores

## PP-81
## REVIEW ON CLIMATE CHANGE AND AGRICULTURE IN INDIA

**Smriti Dwivedi* and Monika Malik1**
*Galgotias College of Engineering and Technology Greater Noida,U.P,India
1Galgotias College of Engineering and Technology Greater Noida, U.P,India
s.dwivedi@galgotiacollege.edu, monika.malik@galgotiacollege.edu

Climate change is undoubtedly one of the biggest crises that humanity is facing today. It has become a major barrier to developing economies, like India where Agriculture is the most important sector of Indian Economy. Indian agriculture sector accounts for 14 per cent of India's gross domestic product (GDP) and provides employment to 45% of the countries workforce. Chief factor that is responsible for the climate change is the "greenhouse effect". The annual mean temperature during 1901-2018 showed an increasing trend of 0.6 degree C per 100 years Temperatures and rainfall amounts in India vary from year to year and influence the amount of crops that farmers can produce. These crops make up the vast majority of grain production during the June-to-September monsoon season. With temperature increasing and precipitation fluctuating, water availability and crop production will decrease in the future in the absence of adaptation by farmers. The climate change's negative impact on agriculture are severe which is projected to have a great impact on food production and may threaten the food security and hence, require special agricultural and environmental measures to combat with.

**Keyword:** Climate change, gross domestic product, greenhouse effect, precipitation

## PP-82
## THE FLARING LIFE: A WARNING CALL

**Srashti Tundelkar, Vishakha Rana and Akanksha Saxena**
Govt. Kamla Raja Girls P.G. (Autonomous) College, Gwalior
srashtitundelkar.st@gmail.com

A Wildfire, wild land fire or rural fire is an uncontrolled fire in an area of combustible vegetation occurring in rural areas. About 21.40% of forest cover in India is prone to fires, with forests in the north-eastern region and central India being the most vulnerable. The major natural causes of wildfire ignitions exist: dry climate, lightning, volcanic eruption. In addition, the most common direct human causes of wildfire ignition include arson, discarded cigarettes, power-lines arcs and sparks from equipment. Wildfires can also be started in communities experiencing shifting cultivation. Wildfires emit carbon dioxide and other greenhouse gases that will continue to warm the planet well into the future and they inject soot and other aerosols into the atmosphere, with complex effects on warming and cooling. Its emissions contain fine particulate matter which can cause cardiovascular and respiratory problems. Vegetation cleared from forests to lessen the risk of wildfire, such as these branches, can yield renewable energy a potential source of revenue to help prevent fires. There's a largely untapped economic opportunity in the forest. Reducing the risk of fire often involves removing vegetation that can fuel fires. Only we can prevent wildfires, the prevention refers to the pre-emptive methods aimed at reducing risk of fires and its severity and spread. Prevention techniques aim to manage air quality, maintain ecological balances protect resources. In areas with an over-accumulation of fuels, a combination of thinning small trees and clearing brush followed by controlled burning can be the most effective method to reducing the risk of catastrophic wildfire.

**Keywords:** Arson, forest fire, global warming, prevention, shifting cultivation.



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## PP-83
## STUDY OF ATMOSPHERIC METAL DEPOSITION AT NANITAL AND MUSSOORIE HILLS OF UTTARAKHAND USING RHODOBRYUM SPECIES AS BIOMONITOR

**Shivom Singh2 and Priyank Pandey**
2Department of Environmental Science, ITM University, Gwalior

The contents of 4 elements (Zn, Pb, Cu and Cd) were determined in Rhodobryum roseum and R. giganteum moss collected from Nainital (Kumaon) and Mussoorie (Garhwal) hills of Uttarakhand, respectively and transplanted along 4 directions at 24 sampling points at the distances of 0.5, 1.0 and 3.0 km. Moss monitoring techniques using transplants, enabled an assessment of the distribution of relative and, for undertaken elements. Transplant bags were exposed for four months, each period representing winters, summer and monsoon season data. Zn and Pb were recorded maximum in all the seasons and sites of Nanital and Mussoorie region could be due to in proximity of road or town of the study area. Whereas, Cu and Cd exhibited the narrowest range of variation. The data of metal analysis from active moss studies proved the potential of moss Rhodobryum as an ideal biomonitoring tool covering large areas because of its abundance and on account of its hyper accumulative properties (as evident from analytical data). From present study, it was found that emission from vehicle exhausts is a major source in busy city centers where most of the vehicular density and generators are highly responsible for metal load. The study also revealed Nanital (Kumaon) as more polluted site over to Mussoorie (Garhwal) which is a pilot tourist spots with very high vehicular density and pollution load. Automobiles i.e. buses, car and other motor vehicles are the only source of transportation for tourists and as well as goods connecting the foothill to these areas. Bioaccumulation ability in these two species of Rhodobryum was evaluated statistically using Dunkun's Multiple Range test.

**Keywords:** Biomonitoring, moss, metal precipitation, transplant, Uttrakhand.

## PP-84
## MICRO-MORPHOLOGICAL CHARACTERIZATION OF DENGUE VECTOR AEDES AEGYPTI

**Neha Kumari and Sunil Dhiman**
Vector Management Division, Defence Research & Development Establishment
Jhansi road, Gwalior, (M.P), India
tnehabtc123@gmail.com

In the present study Ae. aegypti mosquitoes were collected from the different places of Gwalior (M.P) and put to microscopy and RAPD for identification of specific characters that could be used in identification. Micro-morphological study of Ae. aegypti was done using scanning electron microscopy (SEM). Male hypopygium has been used for determination of variation among species at morphology

level. Hypopygium is present in both male and female mosquitoes but it is more prominent among male mosquitoes, so variation can be seen not only at genus level but also at species level on the basis of hypopygium morphology. Additionally 30 RAPD primers were also screened for usefulness in RAPD finger-printing of collected mosquitoes to augment identification. Present study involves primarily morphological tools to identify the differentiable characters in Ae. aegypti mosquito and attempts to identify molecular marker which could help in molecular fingerprints for Ae. aegypti mosquitoes. The RAPD primers used presently could not produced considerable band to use in molecular finger printing using RAPD method as we scanned 30 different primers but didn't find any appreciable results. This suggests that the tested primers cannot be used for RAPD characterization of Ae. aegypti mosquitoes. This study has limitation that it did not employ more RAPD primers which could have been useful for such characterization. This was primarily due to limitation of resources and insufficient time. However study recommends that more primers could be screened to find out workable primers for considerable differentiation of band in Ae. aegypti and other Aedes species.

**Keywords:** RAPD, Aedes aegypti, Hypopygium, SEM, micro-morphological characterization, Gwalior.

## PP-85
## IMPACT OF CLIMATE CHANGE AMONG WOMEN IN DEVELOPING COUNTRIES.

**Sagarika Grewal and Yukta**

Department of Geography, SSN College, University of Delhi
yuktasharma0742@gmail.com, sagrikagrewal1999@gmail.com

The impacts associated to climate change and climate variability vary from one country to another, from one region to another and within the same community as product of the magnitude and frequency within societies. Generally the poorest populations of marginal groups are impacted the most: nevertheless there can be a differential effect on men women as consequences of their social roles, inequalities in their access to control of recourses, their low participation in decision making. For many women, unpaid work in their household takes up the majority of their work hours, with much less time spent in remunerative employment. Even when they participate in the labour market for paid employment, women still undertake the majority of the housework. When women work outside the household they earn on average, far less than men. They are also more likely to work in more precious forms of employment with low earnings, little financial security and few or no social benefits. Women not only earn less than men but also tend to own fewer assets. Smaller salaries and less control over household income contain their ability to accumulate capital. Gender biased in property inheritance laws in other channels of acquiring assets also leave women and children at greater risk of poverty.

**Keywords:** Women Empowerment, Climate Change, Resources, Community.



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## PP-86
## PREPARATION OF DONUT BISCUIT

**Shefali Qureshi, Ruchi Bhadoriya, Soumya Gupta**
Department of life science, Food technology, ITM University Gwalior, M.P.
ruchibsfn1ft18022@gmail.com

Biscuit's are consumed throughout the world their nutritional value and also can be stored for longer duration. Biscuit are available in wide range of shape, size, color, filling. The article covers the type of biscuit found in all over the world. The aim of this work to produce especially biscuit rich in nutrition & less in calories, using various ingredient & flour to characterized the final product that is donut biscuit. The donut biscuit contain coarse wheat and corn flour in various quantity, with other ingredient are sugar (less amount), Butter (help in leavning agent), milk, dark chocolate. The donut biscuit are less fat content not fat free. donut biscuit using different combination 1,2,3. In this combination 3 were found to be best on the sensory evaluation and good nutritional property.

**Keywords:** donut biscuit, dark chocolate, nutritional property, sugar.

## PP-87
## CHEMICAL DESIGNING OF SMART NANOCOMPOSITES TOWARD EFFICIENT ENVIRONMENTAL REMEDIATION

**Nimisha Jadon and Vipin Jain***
School of Studies in Environmental Chemistry, Jiwaji University, Gwalior-474011(India)
e-mail: vipin2012jain@gmail.com

Environmental nanotechnology is considered to play a key role in shaping current environmental engineering and science. Looking at the nanoscale has stimulated the development and use of novel and cost-effective technologies for catalytic degradation, adsorptive removal and detection of contaminants as well as other environmental concerns. The interest in the synthesis of inorganic–organic nanocomposites has grown rapidly due to their wide range of applications. The commonly used nanoparticles for environmental remediation are biopolymers, single enzyme nanoparticles (SENs), zero valent metals, and metallic oxides. Metallic nanoparticles (NPs) of iron groups such as Co, Cu, Fe, and Ni are of interest to many scientists due to their magnetic and chemical catalytic properties, which are small with a highly specific surface area. Hence, these kinds of NPs and their composites with silica, polymer, carbon, and noble metals are appropriate for environmental remediation applications. Nanomaterials present enhanced reactivity and thus better effectiveness when compared to their bulkier counterparts due to their higher surface-to volume ratio. In addition, nanomaterials offer the potential to leverage unique surface chemistry as compared to traditional approaches, such that they can be functionalized or grafted with functional groups that can target specific molecules of interest (pollutants) for efficient remediation. Further, the intentional tuning of the physical properties of the

nanomaterials (such as size, morphology, porosity, and chemical composition) can confer additional advantageous characteristics that directly affect the performance of the material for contaminant remediation and the rich surface modification chemistry along with the tunable physical parameters of the nanomaterial offer significant advantages over conventional methods for addressing environmental contamination.

**Keywords:** Smart nanocomposies, Environmental remediation, Contaminants, nanoadsorption

## PP-88
## STUDY ON CARBONATED BEVERAGES (LEMON)

**Manisha Singh, Muskan Shrivastava, and Payal Sharma**
Department of Food Technology, SOS ITM University Gwalior (M.P.)
singhmani0204@gmail.com

Lemon is a good source of vitamin C. One lemon provides about 31 mg of vitamin C, which is 51% of the reference daily intake (RDI) research shows that eating fruits and vegetable rich in vitamin C reduces your risk of heart disease and stroke. In the present study the qualitative and quantitative analysis of Carbonated beverage of lemon. The blended lemon juice i.e., A;-50:50, B:-60-40, C:-70-30, D:-80-20, E:-90:10 samples are made. The physiochemical analysis as well as sensory parameter has been observed that 40:60 i.e., sample C is the best among other. Further reducing sugar, non-reducing sugar, acidity and total sugar has been observed in the lemon based carbonated beverage. Citrus fruits, as such, have long been valued for their wholesome nutritious and antioxidant properties. It is scientific fact that citrus fruits, especially lemons and oranges, by their richness in vitamins and minerals, have many proven health benefits.

**Keywords:** Lemon, RDI, Carbonated beverage, antioxidant properties, vitamins.

## PP-89
## IMPACT OF POLLUTION ON SUSTAINABLE DEVELOPMENT

**Megha and R.K Sharma#**
#Department of Zoology, N.M.S.N. Dass (P.G.) College, Budaun-243601
joshimegha385@gmail.com

Modern society has introduced or increased human exposure to thousands of chemicals in the environment. To improve his life, he utilizes natural resources, leaving the waste in nature which has adverse effect on the environment and causes environmental pollution. Pollutants are of several types which are released into atmosphere like one component of urban smog hydrocarbons-comes from automobile emissions, petroleum refineries, chemical plants, dry cleaners, gasoline stations, house





painting and printing shops. The only solution to control pollution is to use old methods with new innovative techniques and ideas. It is also a way to honoring our traditions. As long as we use the best and leave the rest from both ends of the spectrum, we can effectively meld the best antiquity and the best of today's technology without any worse side effects.

"Advancement of the old technology with our modern techniques is the key of sustainable development."

**Keywords:** Sustainable development, Pollution, modern techniques, traditions.

## PP-90
## TOMATO BASED CARBONATED BEVERAGES

**Siddharth Mujumdar and Satyam Kumar Tiwari**
Department of Food Technology, ITM University Gwalior, M.P.

Carbonation of fruit juice can have a great scope in the future as carbonated soft drinks are very popular among youths and are known for their thirst quenching and refreshing properties. It is a new concept which provides nutritional elements of the fruit along with natural pigments and flavour in addition to carbonation effects. Tomatoes are rich source of vitamin C or and ascorbic acid. They are essential for a strong immune system and provide protection against cancer and cardiovascular diseases. Inclusion of a fruit juice in soft drinks will not only impart its characteristic colour, taste, and aroma but also removes use of synthetic additives and has some nutritional value. Juicy fruits like tomatoes can be successfully transformed into carbonated drinks. Such fruit drinks are both refreshing and thirst quenching and are bound to cool the stomach and tongue. The utilization of natural fruit based carbonated beverage has not been studied extensively. Generally artificial flavour and sweetners are used in carbonated beverages; therefore the research was designed to evaluate the effects of natural fruit juice in carbonated soda on physio-chemical properties and sensory properties of the carbonated beverages. Since the tomato based carbonated beverages are not available in the market therefore we had prepared five different samples of carbonated beverages which are totally based on tomato juice by adding different concentrations of sugar and using carbonation method. Out of which one sample was tasty, good in appearance and flavour with 40% juice and 60% soda concentration.

**Keywords:** tomato, physio-chemical properties, carbonated beverages, vitamin C

## PP-91
## STUDY ON NUTRITIOUS PASTA

**Sakshi Niranjan, Unnati rajpoot, Priyanka Jaiswal, Akash**
Department Of Food Technology (SOS), ITM University, Gwalior (M.P)
sakshiniranjan277@gmail.com

Pasta is a popular food and its quality can also measured by appearance of flavour and texture. Present study was undertaken to evaluate the quality of pasta supplemented with different quantities of ginger powder. In the present study four samples (S, S1, S2, S3) of pasta were prepared by using refined maida flour and different proportion of carrot powder. Sample S was prepared as control containing only refined maida flour (100%) while sample S1 (refined maida flour 90% carrot powder 10% ), S2 (refined maida flour 80% carrot powder 20%) and S3 (refined maida flour 50% carrot powder 50%) were prepared by changing the concentration of refined maida flour and carrot powder. All the four samples were evaluated for the physicochemical properties (ash, texture and viscosity analysis), nutritional properties (carbohydrate, protein, fat, and fibre), cooking time and sensory quality. On the basis of results sample S2 (refined maida flour 80% carrot powder 20%) was found to be best in quality having more nutritional element and higher overall acceptability.

**Keywords:** carrot powder, pasta, supplementation, nutrition, maida flour.

## PP-92
## WHAT IS MORE DANGEROUS THAN SMOKING?

**Jayashree V. and Kajol Batta**
Department of Food Technology, ITM University Gwalior, M.P.

Junk food commonly known as fast food is prepared in very less time and is one of the major reasons behind health deterioration in human beings. Junk foods are rich in calories and fats. It lacks all the basic nutrients which our body requires. Youngsters are the main targets of Junk food producing companies because of their love for junk food. The Food Safety and Standards Authority of India have laid down several regulations to promote health in schools. Foods which are referred to as foods high in fat, salt and sugar (HFSS) cannot be sold to school children in school canteens or mess premises or hostel kitchens or within 50 metres of the school campus, FSSAI said. FSSAI CEO Pawan Kumar Agrawal had announced that the advertisements of unhealthy foods would be banned in schools. Secondly, encourage school authorities to promote the consumption of a safe and balanced diet in the school as per the guidelines issued by the National Institute of Nutrition (NIN), the draft regulation said. As per the regulations dietitians and nutritionists should be consulted in order to prepare a menu for the children. FBOs to support healthy eating in schools and not marketed,sell,or give away low-nutrition foods anywhere on the school campus, including through logos, brand names,posters,textbook covers,etc,the draft said. These laws ensure the availability of safe and healthy food to school children. A healthy food makes our kids feel better, grow better and learn better and right eating habits can be engrained in the children from a young age. At the heart of these regulations is a fundamental idea to make it clear what is healthy for children and what is not, the regulator said. As per the latest information, junk food turns out to be more harmful than smoking. Hence, it is advised to stick to traditional and home-cooked foods.

**Keywords:** FSSAI, National Institute of Nutrition, Junk foods, HFSS, FBOs.



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## PP-93
## HUMAN RESOURCES AND SUSTAINABLE DEVELOPMENT

**Mamta Dhakad**
Political Science, Govt. Adarsh College, Harda

In many economic textbooks it is argued that environmental policy should be implemented by the introduction of economic instruments. One gets the impression from these publications that the crucial factor in environmental policy is choice of the correct instruments. The same type of reasoning is followed in many publications dealing with the realization of sustainable development. It is argued that many environmental problems would disappear if national and international authorities would accept the concept of sustainable development as a starting point for their environmental policies. India is the seventh largest country in the world. Our country is blessed with many natural resources. But all these resources cannot help our country unless they are tapped, handled and used in a planned way. This can be done only by the people. Man can develop the resources only when he is wise, healthy, educated and properly trained. Thus, the real resources of our country are its people. They are our human resources.

The total population of our country is now more than 100 cores. India is the second most populous country in the world, after China. Today, every seventh man in the world is an Indian. Our country's population is increasing at a rapid rate. It has doubled over the last 45 years. This is the creating many problems. Three out of every four Indians live in villages. They earn their living from farming, forestry, fishing and cattle rising. People are now leaving villages and coming to cities in search of work. This is putting a great pressure on the civil amenities and other facilities in cities.The quality of its people are more important than their number for the development and progress of the country. With improvement in the quality of our human resources, we can make better use of our natural resources. We must all work to improve our own lives and the lives of those around us.

**Keywords:** environmental policy, villages, human resources and sustainable development.

## PP-94
## CHARACTERIZATION OF BACTERIA ISOLATED FROM PETROLEUM CONTAMINATED SITES FORDEGRADATION OF PHENANTHRENE

**Aukib Habib, Mir SajadRabani and Mahendra K Gupta**
Microbiology Lab., School of Studies in Botany, Jiwaji University Gwalior (M.P)-474011, India
aukib77@gmail.com

Polycyclic Aromatic Hydrocarbons (PAHs) are a diverse group of organic substances composed of carbon and hydrogen atoms grouped into two or more fused aromatic ring structures. Phenanthrene

is a tricyclic PAH recognized as carcinogenicby United States Environment Protection Agency (USEPA). The present study was aimed to isolate bacteria from petroleum contaminated sites and characterize them for the degradation of phenanthrene. The study also included evaluation of multi metal resistance by bacteria against different metals like CdCl2, CoCl2, CuSO4, HgCl2, K2Cr2O7, NiCl2, Pb(NO3)2 and ZnSO4. A total of 19 isolates were obtained from five different sites by enrichment method in MSM medium containing phenanthrene as a sole carbon source, which was characterized morphologically and biochemically. Out of total 19 isolates 18 were Gram +ve in nature and 01 isolate was Gram -ve in nature. The degradation study was carried out in MSM broth supplemented with different concentrations of phenanthrene viz. 100, 200, 300, 400 and 500mgl-1. From the results it was found that 07 isolates have shown good degradation potential measured spectrophotometrically based on growth at 600nm. Moreover, the isolates have shown a profound result against different heavy metals. Thus, the study infers that these isolates can be useful in achieving bioremediation of sites contaminated with phenanthrene and various heavy metals.

**Keywords:** Phenanthrene; Bioremediation; Heavy metals; PAHs

## PP-95
## CHARACTERIZATION OF BACTERIA ISOLATED FROM PETROLEUM CONTAMINATED SITES FOR DEGRADATION OF PHENANTHRENE

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Microbiology Lab., School of Studies in Botany, Jiwaji University Gwalior (M.P)-474011, India
E.mail; aukib77@gmail.com

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## PP-96
## NANOTECHNOLOGY IN WATER AND ITS APPLICATIONS IN WASTE WATER TREATMENT

**Harendra K Sharma, Younis Sheikh**
School of Studies in Environmental Science, Jiwaji University, Gwalior
Email: sheikhyounis18@gmail.com

Water is vital to life on our planet and dominates the surface of the earth. It is a remarkable liquid that shows anomalous behavior. Water gets polluted drastically because of increased human activities. Various natural and Anthropogenic activities have contributed to groundwater pollution and have affected the quality of drinking water in the past few decades. To overcome this difficulty, Nanotechnology has been undertaken to explore various efficient ways for the treatment of wastewater in a more precise and accurate way with the support of various nanomaterials. Nanoparticles possess useful characteristics such as a direct bandgap, a high optical absorption coefficient, a layered structure, tunable band edges for optimized catalysis, Low cost, and low toxicity. Nano-adsorbents such as activated carbon, carbon nanotubes, magnesium oxide, zinc oxide, that are usually applied for removal of heavy metals from the wastewater and nano-catalysts such as photocatalyst and chemical oxidants have been shown the potential for removing both organic and inorganic contaminants. Nano membranes have been used for effective removal of dyes, heavy metals using carbon nanotubes. Nanofibers and Nano biocides are used for water purification. Polyvinylalcohol (PVA) and polyacrylonitrile (PAN) contain silver nanoparticles that have excellent antimicrobial activities.

**Keywords:** Nano-adsorbents; Nano-catalysts; Nano-membranes; Wastewater Treatment.

## PP-97
## NANOMATERIALS FOR THE DEGRADATION OF VARIOUS DYES

**Bhupinder Kour, Harendra.K.Sharma**
School of Studies in Environmental Science , Jiwaji University , Gwalior
Email: bhupinderkour18@gmail.com

Organic dyes , one of the major contaminants of industrial waste water are highly hazardous in the environment and are potentially toxic towards living beings. The main contaminants in polluted textile effluent are mostly due to usage of reactive synthetic organic dyes during textile colorization processes. The conventional waste water treatment methods could no longer treat these dyes in an efficient manner and researchers are evaluating new technologies in this regard. Nanomaterials offer the potential to effectively treat contaminants because of their high surface area (surface-to-volume ratio) and their associated high reactivity. Further, the intentional tuning of the physical properties of nanomaterials such as size, morphology, porosity and chemical composition makes it a better

option for pollutant degradation. Among the various nanoparticles, metal nanoparticles are generally considered as safe for human and environment. Several physical, chemical and biological approaches have been used for the synthesis of nanomaterials and nanocomposites. Synthesis of nanoparticles by green root method is an eco-friendly approach and has several other advantages over conventional methods which involve the use of toxic chemicals as capping and reducing agents. Green synthesis is accomplished by several biological systems such as bacteria, yeast and plant extracts. Plants can be used as an important source for bio-reduction of metallic ions and production of nanoparticles due to the presence of various phytochemicals such as amino-acids, carbohydrates, flavonoids, saponins, and reducing sugars . Generally , metal oxide nanoparticles possess potential anti-microbial activities as well as photocatalytic degradation capacity. Nanotechnological applications and products will definitely lead to a cleaner environment and thus helping in environmental pollution management.

**Keywords:** Nanomaterial, Synthesis, Nanocomposite, Bio-reduction, Photocatalytic

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## सूचना – प्रौघोगिकी के सामाजिक प्रभाव

**कैलाश सोलंकी**
समाजशास्त्र विभाग
शासकीय आदर्श महाविद्यालय

जनसंचार के माध्यम संस्कृति एवं समाज मे क्रांति लाते है और विज्ञान, ईलेक्ट्रोनिक ज्ञान का विश्व स्तर पर बोध प्रदान कर रहा है पश्चिम के विकसित समाज कम्प्युटर नेटवर्क के साथ जुड़कर “टेकनेट्रानिक” संस्कृति मे रूपांतरित हो रहा है विशिष्ट संस्कृतिया और समुदाय बहु स्थानिक, बहु जातिया और बहुसंस्कृतिक संकुल के भीतर समाहित हो रहा है तथा दुसरा महत्व के हो रहा है। प्रैस,रेडियो,फिल्,टेलिविजन,साइबरनेटिक और इन्फॉर्मेटिक्स, आज सम्पूर्ण वेशविक संबंध संकुल का नियंत्रण कर रहा है सूचना प्रौघोगिकी और दूर संचार की व्यवस्था के कारण अंक और अक्षर संकेतो के साथ जुड़कर मानव ज्ञान व्यापक स्तर पर बड़ा है टेक्नोलोजी और इलेक्ट्रोनिक संकेतब्रद्ध संरचना प्रस्तुत कर जो कम्प्युटर वेबसाइट की फ्लॉपी मे अवस्थित है सूचना-प्रौघोगिक क्रांति वैश्वीकरण की ही देन है।

वेबर ने अपने शब्दो मे कहते है कि संचारकीय तरकीकरन अर्थात समालोचनात्मक तार्किकता का स्थान गोण होता जा रहा है, उद्देश्य तार्किक, अनुबन्धात्मक नेतिकता पर आधारित है मेकाइवर और पेज कहते है कि हमारे युग कि सर्वाधिक महत्वपूर्ण घटना पूंजीवाद नहीं है बल्कि यंत्रीकरण है जिसका आधुनिक पूंजीवाद केवल एक उपफल या गोण उत्पादन है अब हमे अनुभव हो रहा है कि यंत्रीकरण ने हमारे जीवन के तरीको विचारो, सामाजिक, संबंधो, परिस्थितियो, भूमिकाओ तथा समस्त रूप से सामाजिक संरचना को बदलने मे महत्वपूर्ण योगदान है।

वर्तमान युग सूचना - प्रौघोगिकी का युग है आदिम समाज , क्रषक समाज, ग्रामीण समाज , औधोगिक समाज के बाद आज का प्रौघोगिकीय समाज के नाम से जाना जाता है प्रौघोगिकी प्रत्येक समाज, प्रत्येक युग मे रहा है चाहे सरल समाज हो या जटिल, सभ्य हो या असभ्य, परंपरागत हो या आधुनिक, सभी की अपनी एक प्रौघोगिकी होता है, जो समाज की आवष्कताओ की पूर्ति मे सहयोग प्रदान करती है।

प्रौद्योगिक का अर्थ व परिभाषा:– प्रौघोगिकी कार्य करने की एक प्रणाली है प्रौघोगिकी प्रक्रति के साथ मनुष्य के व्यवहार करने के ढंग एवं उत्पादन की उस प्रक्रिया को बताते है जिससे मनुष्य जीवित रह सके तथा अपने सामाजिक संबंधो और



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मासनिक धारणाओ निर्धारित करता है।

लेपियर के अनुसार – प्रौघोगिकी से आशय उन विधियो,ज्ञान,दक्षता से है जिसकी मदद से मनुष्य भौतिक और जेविकी तथ्यो को नियंत्रित करके उपयोग मे लाता है।

आँगवर्न के अनुसार ,” प्रौघोगिकी का अर्थ किसी भी प्रविधि से है , जिसमे विभिन्न प्रकार के उपकरण , ज्ञान की शाखाए आती है, जिसके आधार पर निर्माण कला विकसित होती है’।

प्रौघोगिकी के सामाज पर प्रभाव :- प्रौघोगिकी और सामाजिक परिवर्तन में प्रत्यक्ष एवं गहरा संबंध होता है। हाथो से कार्य और मानवीय उर्जा के लम्बे समय के बाद मनुष्य कत्रिम उर्जा या मानव निर्मित भाप के इंजन.मशीनीकरण के साथ साथ व्यापक पैमाने पर सामाजिक,आर्थिक,राजनैतिक परिवर्तन हुए। संचार की अनेक प्रविधियां जैसे- तार टेलीफोन,रेडियो,टेलिविजन,आदि से समाज में सामाजिक संबंधो के कारण एवं सिनेमा या चलचिगों से लोगों में विचारो, विश्वासों मनोव्रतियों को बदलने के साथ पारिवारिक,सामाजिक,एवं जातिगत संबंधो को प्रभावित किया है।

- सरल सामाजिक संबंध जटिल आर्थिक सम्बंधो मे परिवर्तित होकर व्यक्तियो मे यंत्रों पर निर्भर होने लगे है।
- संयुक्त परिवार और जाति का महत्व छटकर एकल परिवार एंव एकल परिवार एंव एकाकी रहन सहन कि महत्वता बढी।
- प्रढत की जगह व्यक्तिवादिता होकर मानव जीवन यंत्रवत् है।
- सामाज में प्राथमिक सम्बंधो की जगह व्दितियक संबंध मे परिवर्तित होकर समाज मे प्रतिस्पघा को बढावा।
- वर्ल्ड वाइड वेब (www) ने ज्ञान के स्वरूप और स्वभाव मे क्रांति लाकर व्यापक पैमाने पर ज्ञान के भण्डार मे क्रांति ला दी।
- सूचना प्रौद्योगिकी के व्दारा शिक्षा मे परिवर्तन से शिक्षा के क्षैत्र मे नवाचारों की वाहक बनी। जैसे :- दृश्य-श्रव्य माध्यम से दूरदर्शन पर प्रसारित शैक्षिक कार्यक्रमों ने दूरस्थ बैठे विघाथियों को आनलाइन वेबकॉस्टिंग एंव वर्चुअल कक्षाओ के द्वारा ज्ञान को अधतन करने मे सक्षम हो रहा है।

ग्रामीण दूरसंचार :- गावों में शैक्षिक सामाजिक,आर्थिक विकास के द्वारा लोग अब ग्रामिण सार्वजनिक टलीफोन या मोबाइल होगये है। रेडियो प्रसारण का ग्रामिण क्षैत्रों में विस्तार के साथ किसान रेडियो से कृषि संबंधो जानकारी प्राप्त कर रहे है। आज दूरदर्शन पर कृषि दर्शन और डीडी किसान चैनल का प्रसारण 2015 से प्रारंभ हुआ और अब भारत सरकार द्वारा संचालित किसान पोर्टल,एम पोर्टल पर किसान सुविधा फसल बीमा एंव पशु पोषण एप्प,वन ओलावृष्टि एप, एग्रो मार्केट एप आदि के साथ किसान कालॅ सेंटर पर टोल फ्री नन्बर 1800-180-1551 पर जानकारी किसान ले रहे है।

सूचना प्रौघोगिक एवं नगरीय विकास :- नगरीय विकास में आधुनिक स्मार्ट शहरों की रणनीति का आघार भी सूचना संचार प्रौघोगिकी है। इंटरनेट के द्वारा लोगो तक पहुॅच बनाकर शासन और लोकतांत्रिक प्रकिया मे पारदर्शिता के लिए धीरे-धीरे ई-ऑफीस प्रचलन कर जनसहभागीता सुनिश्ति करने जा रहे है ।अब डिजिटल डेमोक्रेसी का जो रूप हमारे समाने है। उसकी शुरूआत इलेक्ट्रानिक वोंटिग ई-कंसल्टेशन,ई-रिप्रंजेंटेटिव्स,आनलाईन पोलिंग, ई-पिटीशन आदि सुविघाएँ संभव हो गयी है।

जीवन स्तर मे परिवर्तन :- सूचना प्रौघोगिकी के द्वारा व्यक्ति अब दैनिक जीवन से संबंघित कार्यो को सरलता से कर रहे है। - ई-रिजर्वेशन,टेलीफोनख्, बीमा, बिजली बिलों का भुगतान घर बैठे ऑनलाइन भुगतान कर रहे है। ई-मेल निति के द्वारा देश के किसी कौने मे सम्पर्क कर जानकारी प्रेषित कर रहे है।

वैयक्तिक प्रभाव :- व्यक्ति की कल्पनाशीलता और जिज्ञासा के विस्तार के साथ-साथ समाजिक,सांस्कृतिक,आर्थिक,राजनीतिक, गतिशीलता मे नई- नई आयामों की वृद्धि हुई। व्यक्ति में अपने परिवेश और राज्य नियंत्रित संस्थाओ के संबेध में चेतना का विकास एवं मौलिक अधिकार,नागरिक अधिकार, मानव अधिकारो, स्त्री- पुरूष समानता, जाति समानता,

धर्म-निरपेक्षता जैसे मुद्दों पर व्यक्ति जागरूक बनना।

समाजिक प्रभाव :- सूचना प्रौद्योगिकी के कारण संवेदनशीलता एवं गतिशीलता के फैलाव के साथ सामाजिक समानत, अंधविश्वास,असपृथ्यता,निरक्षरता,सांप्रदायिकता,जातिवाद,भ्रण-हत्या,दहेज प्रथा,सतीप्रथा,लैंगिक गैर बराबरी जैसी मनुष्य विरोधी प्रवतियो के विरूद्ध जागरूक होना।

सांस्कृतिक और राष्ट्रीय अस्मिताओं की चेतना फैलाना एवं पर्यावरण प्रदुषण, स्वच्छ पेयजल और आवास व्यवस्था, समान शिक्षा बाल अधिकार, महिला उन्मुलन अधिकार जैसे मुद्दो पर विशेष फोकस किया गया है।

सूचना प्रौघोगिक का आर्थिक एवं राजनीतिक प्रभाव:- आर्थिक विकास को प्रोत्साहन के साथ नवीन आर्थिक संसाधनों, वाणिज्यिक गतिविधियो को महत्व, औद्योगों का ग्रामीण क्षैत्रो में प्रसार, घरेलु उद्योग, हथकरघा उद्योगों का प्रचार, किसान और श्रमिको का जीवन दशाओ के प्रति जागरूकता का विस्तार हुआ है।

सूचना प्रोद्योगिकी के द्वारा समाज में सिविल सोसायटी की भूमिका के प्रति जागरूकता, राष्ट्रीय और क्षैत्रीय महत्व के मुद्दों, संवैधानिक संस्थाओ व राजनीतिक संगठनो में भागीदारी के लिए जनता को प्ररित करना।

सूचना पौद्योगिक के लाभ :- सूचना और संचार प्रौद्योगिक ने मनुष्य के जीवन के जीवन के हर क्षैत्र में क्रांति ला दी है। भौतिक दृष्टि से सबल के साथ-साथ दैनिक कार्यकलाप सरल एवं उनमें कार्यक्षमता में विकास हुआ । विश्व विकास रिपोर्ट के अनुसार भारत में वर्ष 2010 तक प्रति हजार व्यक्ति 4 कम्प्यूटर और वर्ष तक प्रति दस हजार लोगों के बीच कई इंटनेट कनेक्शन थे। प्रौद्योगिक से समाज में औ़ीगीकरण, आधुनिक पुॅजीवाद व नगरीकरण का आरम्भ हुआ। संचार के कारण महिलाओं को स्वतन्त्रता एवं गतिशीलता बढ़ाने के साथ-साथ समान्य जीवन का स्तर भी उन्नत किया है। आवागमन के अन्नत साधन से स्थानीय दूरी में कमी, समाज में श्रम विभजन के साथ-साथ विशेषीकरण का महत्व बढ़ा है। सूचना पौद्योकगीकी ने ई-कॅामर्स, ई- प्रेस्क्रिप्श्न,ई-आरक्षण, ई-शॉपिंग,ई-पेमेंट जैसे आई.टी सेवाओ की शुरूआत कि है।

ई-गवर्नेस और सूचना प्रौद्योगिकी :- सूचना टेक्नोलॉजी युग ने ज्ञान पर आधारित जो द्वार खोले है, उसका उत्साहजनक परिणाम ई-गवर्नेस की अवधारणा के रूप मे उभरकर सामनेआया है। निश्चय रूप से लोकतान्त्रिक सरकार के कामकाज के हर स्तर पर जनता और प्रशासन के बीच आने वाली बाधाओं को दूर करने का सर्वोतम उपाय है। कर्नाटक,केरल, आन्ध्रप्रदेश,तमिलनाडु, महाराष्ट्र,और मध्य प्रदेश ने अपने प्रशासनिक तन्त्र को सुलभ बनाकर ई-गवर्नेस परियोजनाएॅ प्रारम्भ की है। दिसम्बर 2002 में तत्कालीन सूचना प्रौद्योगिकी और संचार मंत्री प्रमोद महाजन ने देश के सभी राज्यों के एक-एक जिले मे ई-गवर्नेस परियोजनाएॅ लागू करने के लिए 309 करोड़ रूपये लागत की महत्वाकांक्षी योजना का उद्घाटन किया।

ई-गवर्नेस के द्यारा सभी विभगों से समन्वय स्थापित कर तकनीकी समस्या के निराकरण के एक मील का पत्थर साबित हुआ है। ई-गवर्नेस के द्वारा तकनीकी सहायता के रूप मे जैसे जैम पोर्टल से सामान खरीदना , एम मित्र , जन मित्र ,लोक सोवाओ द्वारा संचालित सेवाओं,ई-ऑफिस , फसल बीमा, लोकसभा, विधनसथा, नगहीक-विकास,पंचायत चुनाव में ऑनलाइन प्रक्रिया में सूचना, प्रौद्योगिकी विभाग से समन्वय कर महत्वपूर्ण भूमिका निभा रहा है।

सूचना प्रौद्योगिकी और काल सेंटर :- वर्तमान समय में सूचना प्रौद्योगिकी आधारित सेवाए है। सूचना तकनीक उसधारित डाटकॉम के पश्चात काल सेन्टर उद्योग एक बड़े व्यवसाय के रूप में नई कॉल सेन्टर आधारित सेवा है। जिन वस्तुओ के व्यवसाय के लिए कॉल सेन्टर अधिक अपयोग हो रहा है जैसे – मेडिकल ट्रॉसक्रिप्शन, वेबसाइट कन्टेंट तैयार करना। बैंक ऑफिस प्रबन्धन, वितिय सेवाओं,क्रेडिट कार्ड , कम्प्यूटर साफटवेयर एवं हार्डवेयर,होटल पर्याटन उद्योग, एयरलाइन्स, इन्टरनेट आदि के क्षैत्र में प्रत्यक्ष विपणक से जूड़ी कंपनीयो के लिए कॉल सेन्टर उपयोगी है। जिससे कई लोगो को रोजगार उपलब्ध हो रहा है।



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सूचना प्रौद्योगिकी की चुनौतिया का एवं अवगुण :- सूचना प्रौद्योगिकी की दषिसे भारतीय मस्तिक को पूरी दूनिया मे सर्वश्रेष्ठ संज्ञा की दी जाती है। वर्ष 2000 तक भारत का सूचना प्रौद्योगिकी उद्योग दुरी दुनिया में बहुत में बहूत तेजी से आगे लगातार बड़ रहा था लेकिन 2001 की शुरूआत के साथ अमेरिका में आर्थिक मन्दी में भारत का कम्प्यूटर पीढी को अभी ओर विकसित कर अमेरिका की आईबीएम जैसे कम्पनीयॉ भारत के साथ पेशकश करने को तैयार है। लेकिन इस उॅचे सपने का साकार होना सरल नही है। प्रोद्योगिकी से बेरोजगारी में वृद्धि को रोकनेके प्रयास करना चाहिए।

सुचना प्रौद्योगिकी से समाज में प्रतिस्पर्धा बढने से अपराध भी बढ़ने लगे है। और वयक्तिवाहिता, सामुहिकता का महत्व कम, पारिवारिकता की कमी, गांव से शहरो की ओर पलायन करने से शहरो में आवास से गन्दी बस्तियों का निर्माण, कम्पयूटर अशिक्षित साइबर क्राइम, इन्टरनेट पर आज युग में प्रौद्योगिकी की नई-नई तकनीकों को विकसित करने वाले लोग समाज कल्याण मे नही बल्कि बाजार को विकसित करने मे रूचि रखते है।

प्रौद्योगिकी समाज में परिवर्तन कर एक प्रमुख साधन है। मनुष्य की आवश्सकताओं की पूर्ति प्रौद्योगिकी। तकनीकी से ही होती है, अदिम युग से वर्तमान युग तक व्यक्ति के विकास का साधन प्रौद्योगिकी ही रहा है। प्रौद्योगिकी मे हर युग,काल,हर समाज,सभ्यता के विकास में महत्वपुर्ण भूमिका है। वर्तमान में शिक्षा, संचार स्वसस्थ्य, चिकित्सा, आवागमन, भवन,कृषि, प्रशासन, खेल,मनोरंजन एवं सामाजिक, आर्थिक, राजनितिक, सांस्कृतिक क्षैत्रो में महत्वपूर्ण भूमिका अदा की है।

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