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108th Indian Science Congress 3-7 January, 2023, Nagpur

Proceedings of the

108th Indian Science Congress

3-7 January, 2023
RTM Nagpur University
Nagpur

President
Prof. (Dr.) Amar Prakash Garg

SECTION OF ENVIRONMENTAL SCIENCES

THE INDIAN SCIENCE CONGRESS ASSOCIATION
KOLKATA

PROCEEDINGS OF THE

108th INDIAN SCIENCE CONGRESS NAGPUR, 2023

PART II SECTION OF ENVIRONMENTAL SCIENCES

President: Prof. Amar P. Garg

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PROCEEDINGS

OF THE

108th INDIAN SCIENCE CONGRESS
NAGPUR, 2023

I
PRESIDENTIAL ADDRESS

President: Prof. Amar P. Garg

PRESIDENTIAL ADDRESS

A01: What do we need to do for Sustainability of Environment and Development

Amar P. Garg

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The world is facing various environmental problems that mainly include climate change, degradation of ecosystem, scarcity of natural resources to sustain current 8 billion population on this earth, and polluted soil, water and air that need to be addressed by policy makers, business leaders, scientists and the common man in a collective manner. The word "sustainable" has a very broad meaning and has been defined and ill-defined at various forums by various scientists/countries that suits to their business interests. To my mind, the sustainable means "*a process, technology or stage that does not adversely affect the life, environment, earth and the globe and ensures their long term co-existence of life forms without compromising with their quality of life in future generations*". The major issues of environmental degradation need to addressed by reducing the use of fossil fuel to decrease carbon emissions, management of non-biodegradable e-waste, polythene and plastic etc. by encouraging its reuse and recycling, rain water harvesting to increase ground water level and by minimizing the use of systemic antimicrobials to preserve and protect the microbial diversity and its populations to save soil fertility. The policy makers, world leaders, business organizations and environmentalists need to sit together at various national and international interactive platforms to draft and design a policy paper that can ensure a balance between growth and development without harming the natural resources and the environment. The countries doing greater harm to the environment need to make greater efforts to protect, clean and conserve the environment at international level by making proportional contributions to their economic growth. COP-27 in its meeting held in Egypt in November 2022, agreed to establish loss and damage fund by making a draft decision for the first time as "*Matters related to funding arrangements responding to loss and damage associated with the adverse effects of climate change including a*

focus on addressing loss and damage" (COP27 overarching decision Version 18/11/2022). It shows the willingness of world leaders to address the issues related to climate change and environmental degradation. Through, this august body of Science Congress of the Section Environmental, I propose that the environmental damage by different countries be assessed by modern scientific technologies drawing the panel of experts from developing and developed countries both and the contributions of the loss and damage causing countries should be in proportion to the damage and loss caused by them. The fund so generated be distributed to and used by the adversely affected countries only for the protection and preservation of environment and for sustainable development earth.

The adoption of 17 sustainable goals by UN in the year 2015 (Figure 1), and the recent events of climate change, the race to reduce fossil fuel consumption, the transition to green and renewable energy, realization of the importance of circular ecosystem and circular economy, post covid-19 pandemic crisis, have renewed the interests of academicians and policy makers to plan the strategies for sustainable environment and development. The ongoing war between Russia-Ukraine has created international food security crisis and increased costs of energy leading to inflation in several countries. The sustainable economy determines the strength of a country and not the army and arsenals power. The war is not only causing loss of human life but also huge economic loss to the struggling countries and it seems difficult to achieve the target of achieving above 17 sustainable goals by 2030.

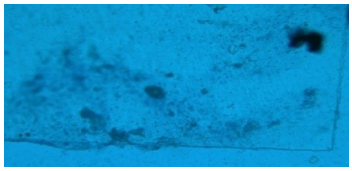
Figure 1: Sustainable goals adopted by UN in the year 2015 to transform the world.

The world needs to discuss strategies to fight with poverty and hunger by focusing on balanced development without causing loss and damage to the environment to create more and more jobs. There are numerous scientific reports that confirms that not only the quality of nutrients but their digestibility is also an important factor to maintain good health. Our group at Shobhit University under the leader of mine and Dr. Neha Bisht are working to improve health of gut microbiome using vegetable diet. We have isolated a large number of lactic acid bacteria (LAB) from human, camel and cow colostrum that have good probiotic potential. The world need to focus on development of smart agricultural technology to suit climate change and the biotechnology based industrial development including the use of green renewable energy for sustainable economy of any country by 2050 and the mad race for the use of fossil fuel based low cost industries will have to be stopped for the protection of the environment and the biodiversity. India is an agro-politically dominant country having 15 agro-climatic zones with diversified population and has one of the richest biodiversity of the world. Agriculture is the primary source of livelihood of 58% (approximately) of its population (Indian Agriculture and Allied Industries Report, September 2019). Agriculture accounts for 17-18% of Indian's Gross Domestic Product (GDP) and remained largely unaffected even during Covid-19 pandemic. To achieve the target of 5 trillion economy by 2025 and to feed increasing world population, the Government of India needs to focus on smart agriculture, rural infrastructure including better irrigation, healthy soil, farmer's and animal's health, post-harvest management, better warehousing and cold storage facilities, and professionalism in agri-business besides the diversification of traditional agriculture for cultivation of pulses, oil crops and medicinal (herbal drugs) plants including floriculture, milking animals, fisheries, piggeries, poultry, goateries etc. During 2020-21 cropyear, the food grain production was at record 308.65 million tonnes which is expected to rise 310.74 (1.71% higher) million tonnes during 2021-22 crop year. Milk production was 198.4 million metric tonnes during financial year 2020-21 while meat production increased only 8.80 million tonnes in 2020-21 from 6.69 million tonnes in 2014-15. India produced 326.58 million tonnes of horticultural products in 2020-21, an increase of about 5.81 million tones (1.81%) over 2019-20. Agricultural exports have performed well during 2020-21 and jumped to US $ 41.25 billion, indicating an increase of 17.34% (US $ 38.43 billion in 2017-18, US $38.74 billion in 2018-19 and US $ 35.16 billion 2019-20). India is also one of the largest producer, consumer and exporter of spices and its products which have reached to 17,58,984.79 tonnes valued INR 30973.32 Crores (US $4178.80 million) during 2020-21 financial year. In fiscal year 2021, the export value for

Indian tea was over 56 billion rupees and coffee about 53 billion rupees. But the increasing use of chemical fertilizers and pesticides in Indian agriculture may reduce the export of agricultural commodities in future years which requires a serious strategic planning and management in view of the growing demands for eco-friendly organic foods throughout the world in post Covid-19 era. Various western countries have already banned the use of several pesticides, particularly systemic ones,as they contaminate the food, water, soil and ecosystem. The serious deleterious effects of chemical pesticides are well known and documented in scientific literature. The increasing use of chemicals in agriculture is increasing our daily dose of poison in food chain including the contamination of soil, water and air besides their several health hazards to the farmers and animals. It has also been the cause of loss of biodiversity particularly the scavengers and the insect pollinators. It has seriously disturbed microbial populations leading to non-degradation of crop residues in the soil and the loss of soil fertility and carbon profile. The quality of foods produced under chemically monitored environment is also poor leading to several health issues due to malnutrition. Hence, organic farming, zero-budget natural farming, integrated pest management, intercropping, biological control, use of biofertilizers and bio-pesticides are the proven sustainable technologies and these are environment friendly and safe for human and animal consumptions. Several commercial bio-fertilizers and bio-pesticides are being produced by various ago-companies with a claim for high yield and management of major plant diseases but the farmers are not satisfied with the claims of producer companies due to non-promising results. We have evaluated the potential of various commercial bio-fertilizers at Shobhit University and have found that the producer companies are required to focus on bio-control agents from different agoclimatic zones using locally available robust strains to make them sustainably viable and active in the field. Our research group at Shobhit University has developed a technology for faster degradation of polythene and oil spills on soil using microbes and the degraded material can be used to enhance carbon content of the soil (Figure 2, A, B, D, E). Shobhit University is also focusing on bioconservation of endangered species using micropropagation of *Elaecarpus gigantrus (Rudraksha) and Adansonia digitatata* (Kalpvaksha) by a group lead by Professor Sandeep Kumar.

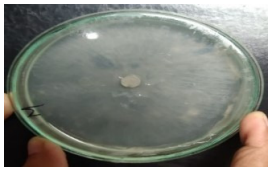
We have also got success in increasing rice yield using combinations of different strains of *Azotobacter* and *Piriformosporaindica* (now called *Serendipitaindica*) (Figure 2 C, F, G).The use of vermin-compost and organic manure is a recommended for maintenance of soil fertility and nutritive value of the food products to fight with hunger and health related issues to achieve the target set by UN. It is expected that by 2050, the health conscious population will consume plant based organic products that are rich in vitamins, minerals and possess balanced nutrients. The

carbon profile of soils of western Uttar Pradesh, Haryana, Punjab and Maharastra are worst affected. Agricultural lands of Punjab and Haryana have become almost barren and western Uttar Pradesh is the next in line. It is estimated that 20% of the world land is degraded which requires immediate reclamation with modern technology to feed ever increasing population on this earth. Satellite picture of earth from Saturn as “tiny” spot has revealed that its natural resources are not enough to sustain qualitative life to the present 8 billion world population which is expected to rise to10 billion by 2050. The abuse of agrochemicals is responsible for worldwide loss of biodiversity and the diversity of pollinators while 75% of the food crops rely upon animal pollination. As per estimate, pollinated dependent food crops contribute 35% of global crop production and are also responsible for the production of newer sustainable varieties under continuously changing climatic conditions. Recent studies have also revealed that the content of vitamin A is fully dependent on pollination. It is, therefore, suggested that the limited use of agrochemicals especially non bio-degradable systemic antimicrobials with organic/natural farming be encouraged as a part of sustainable life and present practice of use of agrochemicals including chemical fertilizers be discouraged in phased manner. Post- harvest losses in agriculture accounts for 20-30 % depending upon the type of crop products which are required to be managed scientifically and strategically with smart planning and better infrastructure to fight with poverty, hunger and health related issues at national and international level. We need to plan strategies for proper distribution of food within and between the nations as during last 20 years the food production has been increased enormously using modern agricultural technologies but the poor storage and mismanagement of transport has led to unequal distribution of food.



A

B



C

D E F G

Figure 2: Degradation of polythene (A) as observed under FTIR using microbes; Oil degradation (B, D and E) under laboratory conditions; Enhanced yield of rice (C, F, G).

Shobhit University has conducted 103 webinars on "doubling farmers income by 2022 (DFI2022)" under the leadership of Professor M. Moni who was the Chief Advisor to the Department of Agriculture and Farmers Welfare, Government of India. The national and international experts in these extensive webinars concluded that India needs to focus on diversified agriculture, integrated global agricultural value chains, strengthening of Agri-informatics and Agri-business, Agri-tech StartUps at Gram Panchayat level (amounting to 2.5 Lakh in number), smart village for better planning and marketing, digitalization of primary agriculture and fisheries Cooperative Societies, Climate resilient agricultural crops and technology for natural farming for preservation of soil fertility and production of nutrient rich crops, agricultural waste to wealth and circular bio-economy. These webinars can be viewed on Shobhit University website as well as on our University's YouTube channel

(https://www.shobhituniversity.ac.in/shobhit-university-webinar-doubling-farmer-income.php). Our research group has isolated a number of species of fungi that can expeditiously degrade rice straw in the fields. Shobhit University is not only advising the Government of India but practically, we have got success in cultivation of temperate flowers and crops like Gladiolus, Daffodil, Tulip and saffron in subtropical climate of Meerut (western Uttar Pradesh) under the leadership of Professor Manoj Nazir. The University has produced two new varieties of *Gladiolus* namely "Shobhit Snow White" and "Shobhit Red". We have also developed a first ever variety of Freesia named as "Amar Garg" by making the crosses between *Freesia laxa* and *Freesia grandiflora* (Figure 3) and further research in this variety is undergoing at our crop research unit. We are transferring this technology to the farmers to enhance their income and the farmers have started growing flowers as cash crops.

Figure 3: New varieties of *Gladiolus* and *Freesia* developed at Shobhit University

Indian agriculture mainly depends upon irrigation and approximately 75-80% of total water is consumed in cultivation of various crops which is also one of the factor for the depletion of ground water level and the use of modern irrigation technology like sprinkling is the requirement of present day smart agriculture for sustainable development. Revival of ponds and other water bodies and the rain water harvesting to increase ground water level are the key solutions for sustainable development. When I was at Chaudhary Charan Singh University, Meerut, we installed total 46 rain water harvesting units on the campus during 2015-16 and we have found that the decreasing water levels of 10 feet per year have now been stopped. Severe droughts in a city like Shimala (Himachal Pradesh) during summer suggest that we are drawing higher quantities of ground water without re-charging it resulting drop of ground water level causing draughts. The rising sea levels every year also indicate that our water management system is defective and we need to put back the water into the ground equivalent to the quantity drawn from the earth and the only better way is the use of rain water harvesting units. If we compare total rainfall of the world over past 100 years, we can easily find that the total amount of rainfall has not changed much, however, the number of rainy days have been reduced resulting in increase of number of heavy rainfall days. Our water management system is not sustainable to manage this heavy rainfall, hence, floods in cities. The coastal areas of rivers have also been encroached by illegal construction resulting in floods in and around the

rivers. We need to re-plan our drainage system, protect rivers, water bodies and focus on putting back the water into the ground using rain harvesting system to make the earth sustainable for comfortable life.

The extensive use of fossil fuel by human is one of the major cause of increased global warming, hence, the emission of carbon needs to be controlled globally and collectively under the directions of expert scientists using newer technologists to achieve the goals of zero carbon emissions by 2050. Carbon capture, utilization and storage is one such technology besides the use of renewable sources of energy including the green energy. Over use of fossil fuel based energy is also one of the cause of climate change which is the biggest challenge before the humanity, the farmers and agricultural scientists and it is estimated that by 2050 this traditional agriculture will need to be replaced by protected agriculture including hydroponics and biotechnologically microbial foods. The world economy will mainly be based on circular agro-bio-economy by 2050 as the cultivable land will also be reduced to half, the drinking water will not be available in nature, climate change will force the farmers to move for newer sustainable crops and the use of agro-chemicals will be banned. Nutrient rich microbial foods will become the solution to provide balanced nutrients to increasing population of the world. It is expected that by 2030, the sustainable development goals are difficult to be achieved by the world and we need to create a common fund at international level to financially support biotechnology based circular bioeconomy for the production of quality products using natural raw materials.

The year 2020 has brought an immense challenge for the world, with a warning of unwelcome events likely to come in near future, if the world does not commit to more resolute actions to change course, to protect environment and biodiversity in the biosphere, the corona like viruses will continue to emerge. In view of the climate change, and over exploitation of the natural resources, the conservation of biodiversity must be the top priority of every citizen of the world to see the sustainable life in 2050. Exceptional efforts are required to address and overcome the effects of the pandemic as part of accelerating progress as the present projections confirm that hunger will not be eradicated by 2030 unless bold actions are taken to accelerate progress, especially actions to address inequality in access to food, to stop wastage of food, to reduce post-harvest losses, to improve food transport chain, to encourage food processing with bio-preservatives, to effectively manage global agricultural market, to encourage high nutritive varieties, protected cultivation, strategies to fight with climate change, to motivate the population for alternate foods including fisheries and to focus on hydroponic and protected cultivation including microbial foods.

Loss of biodiversity due to climate change including global warming, over-exploitation of natural resources, increasing soil, water and air pollution habitat loss and invasive species is of serious concern and need to be addressed at global level for sustainability of the earth. Reduction in carbon emissions, ground water recharge, minimization of non-biodegradable systemic agrochemicals, encouragement of use of bio-fertilizers and bio-pesticides in management of insect pests in agriculture, use of green and renewable energy and reduction of generation of non-biodegradable wastes by enforcing the recycle and reuse of e-waste, polythene and plastic etc., are some of the key solutions to fight with loss of biodiversity. Climate change leads to the loss of biodiversity that results in increase of zoonotic diseases as the healthy biodiversity is essential for healthy life (Nature, 2019). International Union for Conservation of Nature (IUCN), a global network of some 16,000 scientists has estimated that 26,500 species are threatened with extinction. It includes 40 percent of amphibian species, 33 percent of reef building corals, 25 percent of mammals, and 14 percent of birds. Human induced changes are creating conditions for fast biological evolution and biological communities are becoming more similar in managed and unmanaged ecosystems. In May 2019, the Inter-governmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES), released its global report identifying the major threats to biodiversity worldwide. It explicitly noted that: Human population growth is an indirect driver of biodiversity loss (Figure 4) and stated: "*changes to the direct drivers of nature deterioration cannot be achieved without* ***transformative change that simultaneously addresses the indirect drivers***". The population control especially in India and China needs to be addressed on top priority by polity to meet the requirements of sustainable life on earth planet. The number of people Earth can support is not a fixed figure and there is no scientific estimate that how many humans earth could support, because it depends on how we produce, consume and manage and consume our natural resources as way of lifestyle determines that how our environment will be able to sustain future populations. As Gerland said, "When it comes to carrying capacity, it's a matter of mode of production, mode of consumption, who has access to what and how." Can climate change cause human to extinct? The answer is yes, hence we need to work together for sustainable earth.

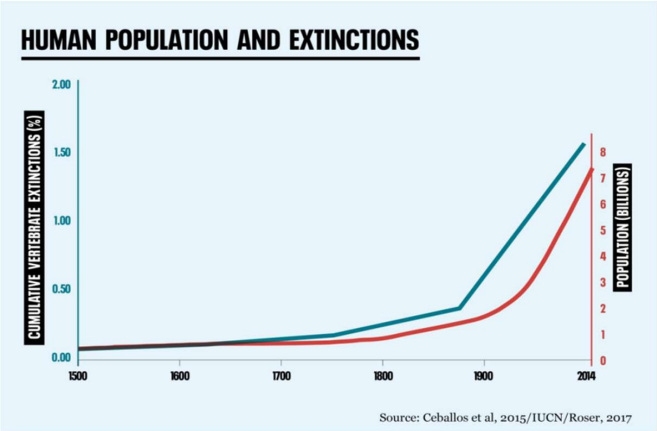


Figure 4: Human population is directly proportional to the extinction of species.

We need to discuss an important question on this august platform of environmental science section of Indian Science Congress that what we need to protect and conserve in biodiversity and why? Our planet is supporting 8.7 million species of which quarter live in water. Plants make up majority of biomass with 320,000 species and fungi constitute 148,000 known species, many more yet to be discovered. The total biomass on planet Earth equates to around 545.8 gigatons of which green biomass make up 82.4% and bacteria make up only 12.8%, fungi – 2.2%, archaea – 1.3%, protists – 0.70%, viruses – 0.04%, animals make up just 0.47% and even more remarkably, humans make up only 0.01% of all biomass on Earth (Figure 5) and the real problem of sustainability of environment and development.

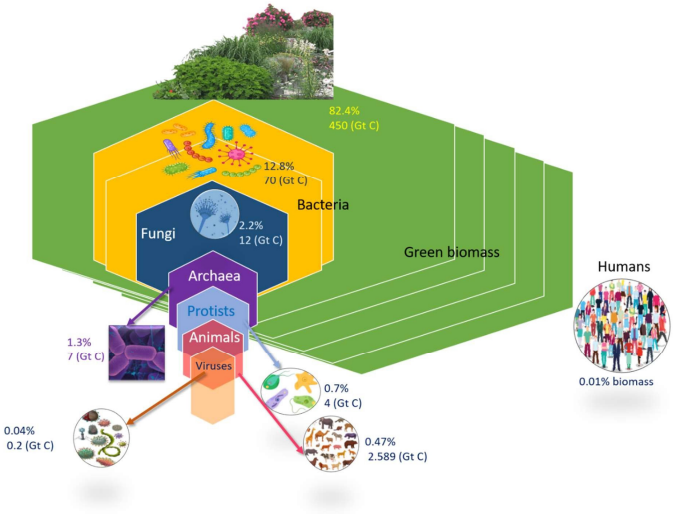


Figure 5: Percent biomass of different life forms on earth planet in terms of carbon

On closer examination, one can easily understand that do we really need more and more green biomass on this earth planet? The answer is no. Then a question arise, what do we need to do for sustainable earth. The answer is clear that we need a balance between the biodiversity and biomass of different life forms. The bacteria, fungi, actinomycetes are the major organisms responsible for recycling of matter on this earth planet and their total biomass all together constitute about 14% only and the loss of this biomass and this diversity can lead to the accumulation of huge waste generated by animals (0.47%) and humans (0.01%). Hence, the scientists, policy makers and executers need to collectively do sincere efforts to protect and preserve microbial diversity. Shobhit University has launched a drive to protect microbial diversity on International Microbial Day, celebrated on 17th September, 2022 (Figure 6).

Figure 6: Save microbial diversity drive launched by Shobhit University.

The increasing needs of growing population has led to the loss of forests and agricultural land and to meet this loss, we need to maximize the use of urban land by increasing vertical green biomass instead of horizontal grasslands. The Government needs to redefine the forests and encourage the protection and formation of small jungles for the conservation of biodiversity. Pollinator gardens needs to created and housing tax benefits be provided to those who have developed significant area into green biomass.

Figure 7: Six major transformations are required by the world for sustainable development

The UN report (2022) has put India at 121/163 rank in SDG Index with a score of 60.32 and it is expected that the climate change, rising sea water level, increasing soil, water and air pollution, loss of biodiversity including microbial populations and diversity leading to accumulation of non-biodegradable waste will become the cause of extinction of human from the earth planet unless we immediately start working collectively on conservation of environment and nature.

Acknowledgements: I am grateful to Hon'ble The Chancellor, Kunwar Shekhar Vijendra for supporting me during all these three years of my tenure as Sectional President of Environmental Sciences, ISCA. I am thankful to all past Presidents of the Section especially Prof. M.G. Tiwari for electing me as Sectional President. I gratefully acknowledge the support of my research group Afifaateeq, Ruchika, Monika Chaudhary, Priya, Jyotsana, Rinni, Anchal, Rashmi, Anurag, Beena, Shikha, Ritesh Arya, Komal, Neha Bisht and my colleagues at Shobhit University.

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II

ABSTRACT OF
PLATINUM JUBILEE LECTURE

PLATINUM JUBILEE LECTURE

A02: *Trichodermaasperellum* T42 regulates nitric oxide mediated root growth and development and provokes disease resistance against biotic stress in plants through enhanced uptake of nitrate nutrition

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Nitrogen is one of the most important nutrients for plant development which is strongly dependent on access of adequate supply of nitrogen present in soil and on the efficiency of its recruitment by plant roots. Rhizospheric microorganisms play a key role for uptake of nutrients available in soil. Nitric oxide (NO) has been known as a signal molecule regulating plant's growth and development. Role of nitric oxide in tobacco (*Nicotiana tabacum* var Kanchan) root growth under nitrate and ammonium source of nitrogen nutrition was investigated by studying the regulation of genes involved in NO homeostasis and measuring NO production and total nitrogen uptake by roots. We also investigated the molecular events associated with root growth and architecture. The results provide evidence that NO production in roots depend on nitrate/ammonium root transporters and expression of nitrate reductase (NR) gene. NRT2.1 and AMT genes accelerated nitrogen uptake by roots, and expression level of plasma membrane bound nitrate reductase gene was responsible for enhanced secondary root growth, mediated through NR led conversion of N to NO. Moreover, NO's involvement in root growth response under above mentioned two forms of nitrogen nutrition was also investigated in the presence of *Trichodermaasperellum* T42.*T. asperellum* T42 seems to modulate root growth in response to nitrate rather than ammonium nutrition. Therefore, T. asperellum T42 may act as a source of potential microorganism/bioagent together with a nitrogen-based fertilizer for obtaining additive increases in fresh and dry root biomass and/ or crop yield.

Besides, *Trichoderma* is a saprophytic, cosmopolitan and root inhabiting microbe. Its colonization with plant roots indirectly activates plant defence mechanism. *Trichodermaasperellum* T42 interaction with pea (*Pisum sativum* L.) roots in presence of NO_3^-nutrition led to nitric oxide (NO) mediated plant immunity against non-host pathogen, *Aspergillus niger*. Expression pattern of NO modulating genes suggested that NO generation

was not only mediated through NR pathways, but NOS and NOA genes might also be involved. However, NO generation was alleviated when plants were fed in 3 mM NH_4^+ nutrient media as compared to 10 mM NO_3^- nutrient. Oxidative and NO bursts mediated disease resistance responses were tested in 70 days old pea leaves against incompatible Aspergillus niger. Greater SOD and RBOH transcript accumulation led to increased H_2O_2 dependent oxidative burst in NO_3^- compared to NH_4^+ fed plants against Aspergillus niger. These effects were further elevated in T42 inoculated pea leaves grown in NO_3^- nutrient condition. The generation of NO emission depended on NR, NOS or NOA expression leading to enhanced defense response mediated though NO burst after infiltration of leaves with Aspergillus niger. Further application of 100 µM SNP (No donor) elevated transcript accumulation of SOD, CAT, APx, RBOH as well as NO modulated genes suggesting that prevention of pathogen spread was mediated by NO signal response. Subsequently, up-regulation of PR1 transcript accumulation in the presence of NO donor suggested that disease resistance was mediated through salicylic acid mediated pathways against *Aspergillusniger*. To conclude, Trichoderma asperellumT42 association with pea roots provoked the plant defence mechanisms mediated through nitric oxide signalling when plants were fed in NO_3^- nutrient media. The overall results obtained clearly indicate about the potential role of *Trichoderma asperellum* T42 in growth and development as well as combating biotic stress responses in plants.

Key words: *Aspergillus niger*, nitrate, nitrate reductase gene, nitric oxide, pea, root growth, tobacco, *Trichoderma asperellum* T42

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III

ABSTRACTS OF SYMPOSIUM/ INVITED LECTURES

SYMPOSIUM/ INVITED LECTURES

A03: Sustainable Resources and Environmental Management of Loktak Lake

Prof.M.G.Tiwari

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Loktak lake is the largest freshwater lake in North- Eastern India, also termed as floating lake in the world owing to the floating phumdis (heterogeneous mass of vegetation, soil, and organic matters at various stages of decomposition) on it. Loktak Lake's main inlow source is the Manipur river. This is the only floating national park in the world. The smaller streams and tributaries bring water as well as significant amounts of silt into the lake, as Loktak sits at the lowest elevation within the surrounding valley. Loktak is famous for its phumdis. The Phumdis are a name given to masses of soil, plants and organic matter that are bound together by roots. This Phumdis-based park is home to the endangered subspecies of Eld's deer known as the Sangai, which is also the State Animal of Manipur. These deer take refuge from the surrounding lake waters and predators on this and other floating plant masses. The Phumdis themselves are made up of a variety of plants, including primarily: water hyacinth, reed grasses, *Oryza sativa* (or Asian rice plant), Manchurian wild rice, various types of *Sagittaria* (such as swamp potato), broomsedge grasses, swamp rice grass, and carex grasses. All of these plants grow well in wet conditions, and have strong binding roots that help hold the phumdis together.

Unfortunately, the habitat of Loktak lake is under threat, such as a loss of vegetation and catchment areas for the lake, as well as increased soil erosion in the surrounding area due to deforestation. This erosion has in turn caused the lake to shirk, as it has filled with considerable amounts of extra silt and natural debris. Additionally, nutrients and sewage in nearby catchment areas have begun to alter the composition of the lake, and in turn decrease the stability and density of the floating islands within it. Similarly, the construction of the Ithai barrage means the reservoir is constantly at peak containment, and the increased water quantity is throwing off the natural ecological processes in the wetland areas. Biodiversity is being affected as well as the delicate balance within this unique ecosystem.

This ancient lake plays an important role in the economy of Manipur. It is considered to be the lifeline for the people of Manipur due to its importance in their socio-economic and cultural life, besides influencing the climate of the State. It serves as a source of water for hydropower generation, irrigation and drinking water supply. The Loktak lake and its precincts have faced serious problems due to loss of vegetal cover in the catchment area and construction of Ithai barrage at the outlet of the lake for multipurpose development of water resources. The degradation of the catchment area has led to the problems of siltation. The sediments deposit at the mouth of the rivers contributes to shallowing of the lake bottom. As the lake become shallower the level of the water also rises. Thousands of hectares of cultivable land and grazing fields are submerged into the water. The construction of the barrage also inundated the area and more people migrated to the phumdis for shelter and took up fishing for their livelihood. The phumdis is one of the major threats to the lake. The growth of phumdis blocks the sunlight falling on the lake and thus affects the fishes in the wetlands. The life of a phumdis is up to 20 years, after that it sinks into the lake causing all the possible environmental degradation to the lake. Loktak lake is a unique and beautiful ecosystem, full of life and diversity. It is popular with both human tourists and various animal species, and is home to the astounding natural phenomenon of the floating plant islands. But if this and other places like it are not protected from human industry and expansion, these beautiful and important ecosystems will be altered beyond repair and will lost.

Keywords: Loktak Lake, Environmental management, Resource Conservation, Biodiversity.

A04: Wetland Monitoring And Health Assessment Using Space-Borne Remote Sensing

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Wetland ecosystems are facing natural and anthropogenic pressures resulting in deterioration of their health, integrity, and resilience. In India, majority of wetlands, both inland and coastal, are failing to withstand the increased stress resultant from these pressures. Resultantly, such wetlands are not able to provide their designated ecosystem services. Conventional methods commonly use point physicochemical measurements to characterize and monitor the health of wetland ecosystems. Additionally, these methods fail to capture the information in spatial domain. Space-borne remote sensing techniques in different parts of electromagnetic spectrum, got a spurt in its usage ever since the first scientific inventory of Indian wetlands was carried out by Garg et al in 1998. In recent years, remote sensing techniques have emerged as a standalone tool for assessment of health and integrity of wetlands and other aquatic ecosystems.

Present article exemplifies, through a few case studies, the use of remote sensing and Geographical Information System for inventorying, monitoring assessment of health, and restoration of wetland ecosystems.

A05: Biodiversity Conservation & Sustainable Human Life

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We need to maintain Natural Recourses for future Generations for this we must answer following questions our self. What is biodiversity conservation? Who's involved? What do they do? How does biodiversity conservation fit into other big picture goals like sustainable development? What exactly is sustainable development? This Webinar takes a closer look at biodiversity conservation and how it fits within the larger concept of sustainable development.

Humans use the planet's resources such as forests, oil and minerals. Many of these resources have accumulated or have grown over thousands or even millions of years!

The 2010 WWF living Planet Report estimates that we'll need the equivalent of two planets by 2030 to support human populations if we continue with our current consumption patterns!

Where will we find that second planet? What happens if we don't find it?

What alternatives are there? These are the unanswerable questions therefore we have to follow Sustainable model for development.

Sustainable human development is about living on earth without taking more than can be naturally replaced. It is about good health, good living conditions and long-term wealth creation for everybody. All these things must occur within the carrying capacity of the planet. To understand sustainable development, think about its three pillars: "economic wealth", "social equity" and "environmental health"; or in other words "profit", "people" and "planet". All three are linked to each other.

In other words, any development has to be not only economically sound but also beneficial to social equity and environmental health. Lastly, we must ask these hard questions ourselves and act accordingly for Sustainable human life:

What if I don't own this?

Do I need everything I own?

What are my real needs?

Am I aware of what I eat, how it Produced & how far it has travelled

Is my computer Energy efficient? Is my computer free of Persistent organic Pollutants (PoPs)?

What is my favorite means of transportation? Do I know how to save electricity and gas?

What I can do to be more sustainable?

It required the deep sense of belonging to the planet and owns it as its integral part.

A06: Environmental Science in the Perspective of NEP 2022

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The National Education Policy 2020, which is a comprehensive framework for elementary education to higher education as well as vocational training in both rural and urban India, was approved by the Union Cabinet on 29th July 2020. This policy outlines the vision of new education system of India and also provides an opportunity of promotion of environmental science in the country. This paper highlights environmental science, which is an interdisciplinary academic field that integrates physics, biology and geography (including ecology, chemistry, plant science, zoology, mineralogy, oceanography, limnology, soil science, geology and physical geography, and atmospheric science) to the study the environment in totality, and the solution of environmental problems, in the perspective of NEP 2020.

Key words: Higher education, Environmental science, National education policy 2020.

A07: Perspective Shift: Preparedness and Disruptive Technologies for the Management of Emerging and Reemerging Infectious Diseases with focus on Natural Products

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Emerging and reemerging diseases have posed a grave risk to all life forms since antiquity. Many serious infections have a history of surfacing/resurfacing from time to time e.g., bubonic plague (black death); spanish flu; plague-I (6^{th}-8^{th} century); plague-II (14^{th}-19^{th} century); HIV, ZIKA, Ebola and COVID-19, among which many subvariants like B.1.1.7 (alpha), B.1.351 (beta), P.1 (gamma), B.1.617.2 (delta) and B.1.1.529 (omicron) continue to emerge. The interaction of various species in different environments often sparks the emergence of highly infectious strains due to cross-species transmission. The fight between species and infectious microbes is an ongoing process that has often resulted in evolution of new pathogenic strains and concomitant counter mechanisms in the host. In addition, climate change and ecological factors are forcing animals into new habitats increasing the possibility of hitherto unseen animal-humans contact resulting in potential spread of zoonotic diseases. Globally, these emerging infectious diseases significantly affect human health, lifestyle, economy, well-being and society. The challenges posed by the recent COVID-19 pandemic in its several forms were confronted and the proactive preparedness and ongoing research in our lab proved helpful in its management. Technological solutions, including detection, protection and medical management were developed for its management thereby saving human lives and overall disease burden. Some such technological solutions developed by DRDO will be highlighted in the talk. On the other hand, antibiotic resistance is emerging as a major concern for clinicians. Extended-spectrum β-lactamases (ESBLs) are rapidly evolving that have the ability to hydrolyze even third-generation antibiotics. Carbapenems are the treatment of choice for seroius infections caused by ESBL-producing pathogens. Cabapenem-resistant enterococci pose a grave danger as they develop new antibiotic resistance mechanisms bypassing treatment modalities. The rich biodiversity endowed by nature has been a source of a plethora of pharmaceutically useful compounds,

several of which find use in modern medicine for diverse applications. This natural treasure offers excellent scope for bioprospection of biological countermeasures. Our group harnessed the potential of natural plant products (NPPs) as countermeasures to ESBLs. Battery of assays were standardized for evaluation of bioefficacy of novel natural compounds (both in vitro and in vivo) and validation of protective efficacy of several unique NPPs against ESKAPE pathogens was carried out revealing significant potential. The results obtained from experimentation will be highlighted. Our studies have confirmed that NPPs have immense potential to be effectively utilized for managing infectious emerging and reemerging diseases. Some case studies based on our research will be deliberated upon. Further, to understand the intricate and unpredictable pattern of such emerging infectious diseases, it is imperative to focus on designing effective tools utilizing newer technologies like machine learning, AI, edge computing, quantum computing, bio-informatic tools etc. to predict and manage disease burden globally.

Keywords: Emerging and reemerging infectious diseases, zoonotic diseases, antibiotic resistance, natural plant products (NPPs), countermeasures

A08: Ethanol Industry: Eco-Friendly Article Of Green Chemistry For Sustainable Auto Fuel For Global Warming Mitigation

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As prerequisites of the thermodynamic equilibrium of earth and healthy civilization, by normalizing global warming and stopping depletion of ozone layer, the conventional chemistry has to be transcended into green chemistry. Green Chemistry is a branch of chemistry that has been necessitated by environmental science to deal with the manufacture and utilization of environment-friendly and human health-friendly chemicals and aiming at redesigning prevailing chemical processes and products to eliminate entirely or partially the hazardous chemical reactants and environmental pollution; and raw materials should be sustainable and not exhaustible like : Enriched Uranium.

Green chemistry requires to be studied in still deeper cognizance in the context of 'Food Security Vs Fuel Security' which will have to be transcended gradually into 'Food Security & Fuel Security'. There are many key issues which need to be addressed to, for example :- transition of exhaustible petrol, diesel, LPG, CNG to biofuels like ethanol, biodiesel, biogas, biomass; transition of synthetic chemical fertilizers to natural organic manures; that of ozone depleting chemicals like existing refrigerants to ozone-friendly chemicals; carcinogenic petrochemicals like benzene to human health-friendly chemicals from natural resources; control of wastages of natural resources; and waste-to-wealth; unfortunate change into artificial lifestyle to bring back to natural lifestyle, etc.

A large number of various natural chemicals contribute to build up Future Green Chemistry in which predominant one is ethanol / ethyl alcohol wherefrom n number of various green chemicals emanates in which an important outlet is Auto Fuel. It is the purest chemical produced on very large scale, but next to sugar in the world. It is a green chemical very versatile in mainly energy, automobile, higher chemicals, medical, solvents and other miscellaneous sectors in which we shall confine its use here as sustainable auto fuel.

Chemical industry effluents are generally of two kinds; biodegradable and non-biodegradable. After declaration of 'Kyoto Protocol' in 1997, a mandatory whip has been exerted over WTO's member countries' chemical

industries to treat their wastes / effluents to zero pollution. Unlike petrochemical industry, Modern Distillery / Ethanol industry effluent being biodegradable in nature, has great economic advantage of converting waste to wealth. Different kinds of wastes are treated to produce useful products to make this industry economically more attractive. After transferring invention of car to road, to cater to its auto fuel needs, Brazil had first conceptualized ethanol / power alcohol for transport in 1926 thus had set an ideal in world by adopting renewable energy in transport sector. After oil shock from OPEC in 1973, constantly increasing petrol and diesel prices compelled us to opt for alternative, indigenous, renewable auto fuels like ethanol, biodiesel and compressed purified biogas. Present World and Indian Ethanol scenarios have been discussed with shares of renewable energy sources provoking the challenges to meet vast scope for ethanol ahead. Worldwide how legally ethanol-mixing has been made mandatory in petrol and diesel on the way gradually to reduce dependence on OPEC countries to countercheck their monopolistic business of crude oil and how they have launched long term massive programmes to encourage it, being renewable. For example, U.S.A. have enacted legislations for biofuels by framing 9 Acts in only 20 years right from 'Energy Security Act 1978' up to 'Energy Conservation Reauthorisation Act 1998'.Cane molasses cannot suffice for required alcohol production to divert alcohol partly for ethanol. Hence, other raw materials are being adopted. It is the task of human wisdom to equillibriate balance of raw materials between food and fuels. This criticality will also be deliberated to retain this sustainability, direly in need to make India self-reliant to maximum extent in spite of our international dependency in globalization in W.T.O. era.

The entire presentation on ethanol proceeds from brief history; developments of gasohol; types of alcohol; World and Indian Ethanol Scenarios; large benefits of ethanol as auto fuel in the context of interfaces between Energy :Environment : Economics : Education : Water (E4W); comparison between India and Brazil; production technologies; Ethanol / Modern Distillery waste to wealth; ethanol in diesel : diesenol; biofuel policies; role of ethanol in environmental protection; and finally, sustainability of ethanol industry. Critical issues therein, will be explained in detail orally wherever necessary.

Thus, meeting the rising needs of alcohol and ethanol, when present raw material molasses cannot suffice them, the advanced 2nd generation technology of Biomass to Ethanol has emerged worldwide to produce alcohol abundantly to cater to its numerous applications especially ethanol as Auto Fuel.

GOI have formulated 'National Biofuels Policy-2018' for threefold advantages : 1) To reduce dependence on import of crude oil thereby

foreign exchange outgo; 2) To reduce environmental pollution atleast partially caused by transport sector; 3) To increase farmers' income to make agriculture viable. Hence, GOI have come out with various strategic schemes to accelerate ethanol production to meet huge requirement toadmix in petrol in gradually increasing proportion. Therefore, ethanol being a prominent article of Green Chemistry, is playing pivotal role in various walks of Indian Economics and in Global Warming Mitigation.

Keywords :- Environment Sciences, Green Chemistry, Green Energy, Green Technology, Green Initiatives, Ethanol, Ethyl Alcohol, Power Alcohol, Gasohol, OPEC, CDM (Clean Development Mechanism), U.S.A. Legislation, Biofuel Legislation in India & other countries, Climate Change, Global Warming, Food Security Vs Fuel Security and Food Security & Fuel Security, Renewable Energy, Sustainable Development and its Criteria. Advanced Technology of 2nd Generation for Biomass to Ethanol Production, 'National Biofuels policy-2018', Indian Ethanol Scenario & World Ethanol Scenario, etc.

A09: Remediation of lead (Pb) from aqueous medium by solid agricultural wastes

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Bio remediation of lead using maize stem powder, as a low cost and eco-friendly alternative , has shown that the adsorption data was the best fit with Langmuir isotherm. Maximum percentage removal of 99.7% was recorded at pH 7 and 26°C. The kinetic data followed first order kinetics. FTIR data analysis before and after adsorption showed the functional groups involved in the adsorption of Pb(II) on the surface. The main functional groups are phenolic, carboxylic, carbonyl and amino groups which act as active sites of adsorption. Effect of various factors such as pH, adsorbent dose and time interval was studied to determine the equilibrium condition.

Keywords: FTIR, Langmuir isotherm, pH, Bioremediation.

A10: Adaptation and Mitigation to Enhance Climate Resilience of Forests and its Dependent Communities: A Case Study from Landscapes of Jharkhand

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Many reports and studies spotlight severe risks to humans, ecosystems and species if the world fails to halt adverse effect of climate changes. Forests which are key to ecosystem services have been impacted by climate changes and subsequently the forest dependent communities are also suffering. In this background department of Forests, Environment and Climate Change, Jharkhand has initiated a project in Ramgarh and Jamtara districts of Jharkhand to enhance capacities of rural people and providing support services for facilitating Adaptation; improvement of forest micro climate through Soil and Moisture Conservation & Water Harvesting; enhancement of climate resilient livelihood systems; to bring about small wood use efficiency and alternative material and energy use. The project has brought visible contribution in the wake of the national commitment to make India carbon neutral by 2070 and the idea of LiFE by the honorable Prime Minister at the Glasgow summit (COP26). The present paper describes how these mitigation and adaptation measures have a multiplier effect on livelihood creation, food security, land improvement, water conservation, SDGs etc. It will serve as a future roadmap to adopt such landscape approach on larger scale.

Keywords: Adaptation, Jharkhand, LiFE, Mitigation.

A11: Globally Environmental Impact on Reproductive Health

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Global warming is one of the biggest challenges for the scientist due to increased consumption of industrialization as well as increasing population. Since environmental changes directly influence on human health, global warming can augment multiple diseases including cancer and infertility. Large number of environmental factors such as pollutants, chemicals, temperature, radiations and xenobiotics can directly impact of genetic mutations in germ cells altered reproductive health. Our research group is exploring the understanding the interaction between environmental factors causing genetic mutations leading to altered reproductive performance. In our laboratory shown the levels of arsenic is ~10 folds higher than the normal fertile malesmay be a major causative factor for mutations followed by damage of germ cells (spermatogonia) in testes. Besides cytogenetic and molecular genetic alterations based on karyotyping as well as FISH analysis determined numerical levels with a high frequency of XXY and XYY karyotype with ring chromosome are novel findings. Molecular aspect includes microdeletion of AZF and SYCP-3 as well as MTHFR C677T gene polymorphism increase “risk factor” in non-obstructive azoospermia (NOA. There is series genes PCDH11Y, AKAP3, USP9Y, PCDH11Y, MTNR1B, SENP3, ARSD, SOX9,AKAP3,PLOD3 and CLUB4 have been characterized present on sex chromosomes either X or Y chromosomes as well as on autosomes. Besides this large number of genes has been characterize using WES (NGS) whose function is yet to determined and affect reproductive health. Although, environmental factors such as Arsenic contamination is the major contributory factor besides other (trace elements like Cadmium or Lead)) influence proliferation of germ cell (spermatogonia) during spermatogenesis by disrupting endocrine dysfunction. Hence, socioeconomic, dietary factors including alcohol and profession those who are expose of radiation or pesticides or automobile fumes are also relevant factors for reproductive health, **highly susceptible to environment.**

A12: Environment conflict, Rights of Nature and Human Life

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Nature element (Prakriti), covering all the biospheres from which we are directly or indirectly benefitted and our physical, spiritual and mental consciousness are affected. In our ancient literature it has been said that five big elements of universe are- Kshiti (earth), Jal (water), Pawak (Fire), Gagan (Sky), Sameer (Air) together constitute our physical and biological environment. In our vedic literature these 5 elements have been termed as Devta, derived from Sanskrit word div meaning one who is divya and have extra celestial powers (paralaukik) i.e. centre of immense spiritual power but in Bhagwat Gita Lord Krishna has added three additional elements besides above five, they are Mann, buddhi and aham. Thus spiritually these 8 elements together constitute complete environment. In Yajurved Mother Earth has been called as Taptayani. So it is our moral duty to protect Mother Earth. The environment can affect human health; good environment means good health and hazardous environment may lead to health hazard. Environmental hazards may lead to many illness inter alia, increase the risk of cancer, heart disease, asthma etc. These hazards can be physical, such as pollution, toxic chemicals, excessive use of cell phone, and consuming unhealthy food, or they can be social, such as unsafe work, poor housing conditions, urban slump and poverty.

A13:Therapeutic Efficacy of Ursodeoxycholic Acid (Fortibile® tablet) Against Arsenic induced Hepatic nitric oxide and reactive intermediate toxicity in Maurine model

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Arsenic (As) is an ubiquitously distributed environmental toxicant predominantly contaminating drinking water. Hepatic injury induced by arsenicals is closely related to oxidative stress by triggering the production of intracellular reactive oxygen species (ROS), which can play a key role in the toxic effect of arsenic and its compounds. Objectives: The aim and objective of the present study is to investigate the use of Fortibile®tablet containing Ursodeoxycholic acid (UDCA) in prevention of the hepatotoxic effect and biochemical changes induced by Arsenic (As) contaminating drinking water in laboratory mice. Materials and Methods: Adult healthy Swiss albino mice were divided into four groups as control, UDCA (Fortibile® tablet) 20 mg/kg treated, Arsenic trioxide(ATO) 5mg/kg treated and UDCA+Arsenic trioxide(ATO) 5mg/kg treated.

Results: Application of Arsenic trioxide(ATO) led to significantly decreased body weight(BW), food consumption, water intake and significantly increased liver weight in mice. However pre-treatment with UDCA (Fortibile® tablet) normalized the same as compared with untreated control animals. Animals treated with Arsenic trioxide(ATO) had elevated activities of serum aspartate aminotransferase (AST), alanine aminotransferase (ALT), alkaline phosphatase (ALP) as well as total and direct bilirubin levels. Elevation of these liver function enzymes was restored in Fortibile® treated animals. On the other hand Arsenic trioxide(ATO) treatment significant increase in serum and tissue malondialdehyde (MDA)and nitric oxide (NO) content but simultaneous decrease in glutathione GSH and GPx content. Combine therapy of UDCA and Arsenic trioxide(ATO) resulted in reversal of the above effect. UDCA was also found to significantly restore the protein levels of interleukin 6 (IL-6), interleukin 1β (IL-1β), and tumor necrosis factor-alpha (TNF-α). Apart from this gross morphology of the liver, H&E liver histology and massontrichrome & serius red examination of the liver section strongly supported the UDCA is a potential therapeutic against As toxicity. Conclusion: In conclusion Fortibile® tablet containing Ursodeoxycholic

acid (UDCA) acts as an effective hepato protective agent against Arsenic trioxide(ATO) induced liver dysfunction, and this effect might be related to its redox inhibition property. Additional hepatic functions can be monitored, and relative dose of Fortibile®-Arsenic trioxide(ATO) therapy can be titrated to observe optimum effect.

Keywords: Ursodeoxycholic acid; Arsenic; Oxidative Stress; Hepatotoxicity; Free radicals; Nitric oxide

A14: Sustainable Recycling of Global E-waste: Challenges, Solution and Opportunities

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The e-waste management is becoming one of the big and serious challenge tackled in the twenty-first century owing to the escalating figure rise globally and mainly treated by informal sector, especially in developing countries, and leads to their potential cause of hazardous source of contamination and valuable materials loss. And due negative impact, these complex metallic and non-metallic fractions triggering severe negative impact causing within the natural ecosystem, risking the living species; if not dealt with appropriately. Hence, there is a demanding for quick action on the best e-waste management strategies for developing and developed countries. On the one side, the separation and recovery of the valuable and precious fractions from the e-waste may be an identical dimensional strategy of economic point of view, and while at the same time plunging the disturbing threats to natural ecology. Though, these risks are somehow better addressed by the developed countries to at least some extent through the strict law enforcement, and appropriate recycling facilities. However, the many of the developing countries lacks the relevant focus law, gaps in policy and strategy making, socio-economic environmental barriers, technology advances and limitations, and the proper handling facilities.

This article identified some major gaps abstaining the best e-waste management approach, particularly in the developing. For example, the integration of the informal and formal sectors, authorised network registry, strict enforcements of relevant law, manufacturers obligation with improved eco-designs, regulated transboundary movements, better consumer awareness, and, investing on best recycling facilities as well as advance disposal services are very important. Additionally, substituting the conventional and traditional procedures with the innovative and eco-friendly scientific methods for example integrated processes using hybrid technologies and micro factories will significantly fixing the current barriers of the e-waste management. In conclusion, this article will be a thorough glancing for the forthcoming research on management of e-waste of small to larger scales. Therefore, in this article, the management of e-waste is evaluated having the developing countries recycling system as an

example. This article presents systematic illustration of a simplified self-help group (SHG) park.

The SHG park could use Apple's Daisy robot, or similar technical assistance, and financial infrastructure as an eco-friendly model for supplementing a circular economy on e-waste management in developing countries. The motivation for creating SHGs approach, depicted in the box under robotic technology, include benefits to labour, public health, environmental protection, economic productivity and boosts for sustainable development. In order to scale up to support e-waste management at the national level in developing countries these SHG parks need support either through the micro-financial systems of the banks offering initial financial provisions, or through corporate social responsibility funding by involving experienced institutions/organizations to promote the SHG formation — and this must be implemented under the umbrella of the environmental regulatory authority of the country. Closing the current gaps in the circular economy framework for electronic waste will also require continuous monitoring and assessment to support the shift from waste disposal to recycling and resource recovery.

Keywords: E-waste; Informal sector; Sustainable recycling; Resource recycling; Self-help group park; micro-financial systems.

A15: Social Entrepreneurship and Environmental Management: A special case study on East Singhbhum districts

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Past Recorder(2018-20)

Even though, socially entrepreneurial activities have been going on since the late 19th century, it was only in the early 1980s that its current form has been popularized. In terms of a sustainable approach to tackling social problems, the term was used first in the 1970s as an effort to "use managerial skills to address social problems as well as to address business challenges". Since then, many individuals and organizations, have contributed to the global growth of the field. A social entrepreneur in order to develop, fund and implement solutions to social, cultural, or environmental issues takes risk and effort to create positive changes in society through their initiatives. The present paper seeks to bring out the effort and strategies of few social entrepreneurs from the East Singhbhum districts. Case studies has been used to highlight their contribution in terms of environment management. The paper also builds on the premise that social entrepreneurship not only gain a profit but also create a social value to solve an environmental problem.

Keywords: Social Entrepreneur, Environmental management, Social awreness, Sustainablity

A16: Shifting Cultivation Landscape In Manipur-Towards Resolving Environmental Conflict

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Hill ecosystems are generally fragile and susceptible to soil degradation from cultivation that pose a fundamental challenge to the natural environment. Using land resources for agriculture prioritises crop production displacing other benefits that natural ecosystems provide like biodiversity conservation and carbon storage. Shifting cultivation generally known as Jhumming is one of the most primordial system of farming which is thought to have originated in the Neolithic period. It is a system where a plot on hill slopeis cleared by cutting down and burning of forests and crops are then grown for 2-3 years, after that the land is abandoned to regenerate and restore soil fertility. Shifting cultivation an ancient agricultural practice in NE India is responsible for degrading the soil properties, reducing the crop productivity, impact adversely biodiversity and ecosystem services. In NE India, this cultivation is practiced predominantly by the tribals of the region and linked with their ecological, socio-economic and cultural life. At present due to population pressure, the Shifting cultivation cycle of earlier times for 10–15 years has been shortened to about 2–3 years in Manipur; the fallow period is reducedand cultivation on steep slopes have converted and degraded the native forests . The recovery of vegetation at different stages of succession after abandonment was assessed in the Jhum fields of 5, 7 and 12 year fallow plots . This paper also evaluates the Soil Carbon Dynamics along the shifting cultivation landscape and indicate the role of regenerated vegetation cover in conserving and enhancing soil available nutrients and enriching diversity along the chronosequence.

Keywords: Agriculture Practice, Soil Degradation, Jhum fallows, Regeneration , Carbon Dynamics

A17: Recycling of Agrowaste For Mushroom Cultivation and Women Empowerment

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Many of the developing countries produce huge quantities of agro residues but they are used inefficiently causing extensive pollution to the environment. The major residues are rice husk, coffee husk, coir pith, jute sticks, bagasse, ground nut shells, mustard stalks and cotton stalks. Sawdust, a milling residue is also available in huge quantity. Apart from the problems of transporting, storage and handling, the direct burning of loose biomass in conventional grates is associated with very low thermal efficiency and widespread air pollution. As a typical example, about 800 tonnes of rice husk ash are generated everyday in Ludhiana as a result of burning 2000 tonnes of husk. Almost all kinds of agro residues can be put to the best use by recycling them for mushroom growing. The process involves conversion of agro residues into a fine compost by bacterial and biochemical decomposition. The other steps in the process are spawn preparation and spawning of compost, mushroom harvesting, mushroom preservation and mushroom recipes. Nutritionally mushrooms comprise a valuable source of health food, low in calories and carbohydrates, rich in proteins, essential amino acids, fibers and important vitamins and minerals including B-complex vitamins, iron, potassium, selenium and zinc. In medicine, they are used for immune modulating both humoral and cellular immune factors in the body. Out of 2000 species of wild edible mushrooms all over the world, only about 20 species of mushrooms are commercially cultivated and the agrowaste being used mainly include wheat straw and rice husk. Hence there is a huge potential for bringing more and more wild edible mushrooms under artificial cultivation on a variety of agro wastes like bagasse, saw dust, coir pith and coffee husk. The most significant aspect of mushroom cultivation, if managed properly is to create zero emission (no waste). The need of the hour is to recycle different agro wastes as substrate to grow mushrooms and bring a “non green revolution”. Moreover, the entire mushroom growing activity starting from composting, spawning and harvesting involves a very small level of labor which can be very easily handled by rural women self-help groups which ultimately can lead to their financial empowerment by starting this activity from a very low level and reaching upto the entrepreneurship level. Further the medicinal properties of mushrooms also represent a relatively untapped resource for medical applications. So, there is also a need to

unearth the vast treasure of wild and cultivated mushrooms for their medicinal properties. In this way, we can also resolve the environmental and farmers' conflict which arises every year due to the burning of agro waste by the farmers of North India resulting into the stagnation of human activity due to huge pollution in the National Capital.

Keywords: Agrowaste, recycling, mushrooms, compost, women empowerment

A18: Role of Carbon Capture and Storage in Achieving India 2070 NET ZERO target

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As per IPCC and IEA, CCS will play a critical role in decarbonisation of industrial sectors toward achieving Paris Agreement ambition of keeping the global temperature within 1.5/2.0 ^{0}C as compared to pre-industrial levels. CCS has potential to address overall 10-13% of global CO2 emissions by 2050. CCS brings strategic value in 4 key areas:

1. Reduce emissions from existing Energy infrastructure such as coal and gas fired plants by retrofitting CCS solution
2. Decarbonise hard to abate industrial sectors such as cement, steel and other industrial sectors
3. Provide a cost-effective pathway for Blue Hydrogen
4. Negative emissions by Direct Air Capture and BECCS (Bioenergy CCS)

As per IEA report on Net Zero, there is a need to enhance CCS capacity from 40 million Tons of CO2 Injection per year in 2021 to over 7.6 billion Tons of CO2 injection per year by 2050, which is creating 190 times more capacity over next 30 years. Today, more than 150 new projects have been announced totalling over 500 million Tons of capacity generation by 2030. These projects have been driven by global commitments towards decarbonization, tightening emission norms as well as supported by government policies and incentives around the globe. Permanent storage of CO2 in geological formations does not generate a direct revenue. Therefore, business case for CCS project relies on some form of carbon pricing, which is a prerequisite for the CCS industry to take off successfully. These carbon pricings can be in the form of incentives such as 85$/ Ton of tax credit under 45Q scheme in USA or carbon tax such as in Norway or license to operate (such as for many LNG/ new gas field development projects in Australia). Cap and trade system such as European Trading System (ETS) also enhance the attractiveness of CCS projects as an alternative mechanism to abate emissions.

India is the third largest GHG emitter today and with significant growth in economic and industrial activity, its emissions will go up unless various pathways such as renewable energy, electrification, green hydrogen and other measures such as CCS are put in place. India announced its

commitment to be net zero by 2070. CCS, in addition to other measures, can support India towards its decarbonization goals while taking it on a low carbon growth. However today India does not have any CCS project (whether commercial or pilot) due to lack of regulatory framework and financial support/ incentive/ carbon pricing not existing.

On 29 July 2022, the Indian Lower House of Parliament published an amendment bill to the 2021 Energy Conservation Act setting out the framework of a voluntary carbon credit trading scheme. India's Bureau of Energy Efficiency (BEE) presented a draft blueprint for the phased introduction of a national Cap-and-Trade system in India, providing for the introduction of a voluntary market in the first phase and moving to a mandatory cap and trade emissions scheme in third phase. This will provide a significant impetus to carbon financing in India and propel industries towards reducing their carbon emissions.

Given very nascent stage of CCS in India, Oil& Gas leaders are in the best position to champion this technology and provide a decarbonization solution for industrial sectors. Most of the early projects in CCS in several countries have been funded/ supported by government and/or executed by state owned entities. CCS projects have a long cycle and from feasibility studies to pilot to commercial projects, it can take anywhere from 5-10 years. By investing in CCS at an early stage, the leading players in India can play a key role in helping India achieve the ambition of being a Net Zero country by 2070 and provide additional economic value to the industries and country.

A19: Biological effects of IR during Radiation eventualities: Need of radiation countermeasures

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Ionising radiation (IR) exposure instigates functional alterations, reversible structural changes and irreversible changes including mutations, malignant transformations or death in the living cells. IR can cause damage to bio-molecules directly, because they possess sufficient kinetic energy to produce ionization or indirectly by inducing generation of free radicals. Damage to important biomolecules can compromise structure, integrity and biological function of important cell organelle ultimately driving cell to undergo mitotic catastrophe or cell death.

In case of accidental IR exposure or act of terrorism it can cause extensive damage that is practically irreversible and also reflects in impending generation. Biological effects of IR in living organisms are strongly dependent upon the type of radiation, radiation dose, dose rate and time of exposure. High dose IR exposure in potential disaster scenarios causes acute radiation effects resulting near term mortality as well as long-term adverse health effects. High dose total body irradiation (TBI) or significant partial-body irradiation can result in acute radiation syndrome (ARS), that can also eventually lead to death.ARS manifest following different doses, at different times after TBI and induce damage to large number of cells preferably highly proliferative tissues. Proliferating stem cells are progressively more sensitive against radiation induced damage than other determined lineages.

Amifostine (WR2721, Ethyol), 2-(3-aminopropyl) aminoethyl phosphorothioate, is the only radioprotective agent fully approved for human use FDA for a very narrowly defined medical indication. Because of the potential side-effects, amifostine has not been approved for general use in radiation protection. It is necessary to identify efficient, medically safe, and affordable radiation countermeasure agents (RCAs) for the prevention or management of acute radiation syndrome (ARS). For more than half a century, rigorous efforts have been made RCAs aimed at reducing biological effects of IR and mortality with least or no toxicity. Development of safe and effective radiation countermeasure agents is necessary for management of biological effects of radiation in human

beings. Moreover, a safe radiation countermeasure agent will be useful for patients undergoing routine radiotherapy against cancer and are at increasing risk of ARS associated side effects.

Key words: Ionising radiation (IR), Radiation countermeasure agents (RCAs), Acute radiation syndrome (ARS), Reactive oxygen species (ROS), total body irradiation (TBI)

A20: Climate Change Conflicts and rights of nature – Whether we are really addressing the issues?

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Environmental conflicts or ecological distribution conflicts (EDCs) are social conflicts caused by environmental degradation or by unequal distribution of environmental resources. There was also a distinct difference in the types of conflict found in high and low income countries. There were more conflicts around conservation, water management, and biomass and land use in low income countries; while in high income countries almost half of conflicts focused on waste management, tourism, nuclear power, industrial zones, and other infrastructure projects. According to the United Nations, climate change is a 'threat multiplier'. Climate change-related degradation of natural resources, such as arable land and water supply, acts as significant instigators in violence and has contributed to multiple armed conflicts, both on the international and local levels. In this paper, different environmental conflicts and rights of nature explained and how this can be addressed regionally and globally to reduce the severity.

Keywords: Environmental resources; Climate Change; Waste Management; Social Conflicts; Low income countries.

A21: Boosting of Algal Biodiesel Production from Spirulina Wild Stuff Explored directly in the Natural Habitation

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The exploitation of various resources for the production of energy has now arrived at the level that the whole world is depending on the same. Fuels are considered to be the most important sources of energy production. For a decade, there is an alarming situation regarding overutilization with the hankering of all the available sources are being diminished due to increased biofuel production. Thus, the precedence on algal sources and asserting its diverse category found to be most promising based on its efficiency and production competence of all types of biofuels. Hence, a case study was attempted on standardizing the parameters for achieving biodiesel production from a distinctive approach where the identified wild stuff of algal biomass (Spirulina maxima) grown at its natural conditions. The composed algal wild stuff was subjected to extraction of the crude lipids using a flawless solvent system coupled with the soxhlet method. The accumulation of lipid contents was expansively analysed and the oil obtained from lipid content was subjected to transesterification using both acid (H2SO4) and base (KOH) catalysts for its analogous fatty ester which is the potential way out to the high viscosity elements that ultimately converted algal oil into biodiesel. Further, the optimization of transesterification parameters for boosting algal biodiesel production at variable reaction factors was carried-out with respect to; molar ratio, temperature, reaction time, stirring speed, and amount of promising catalysts were also evaluated. In the acid esterification process, the acid value (AV) was reduced from 11.43 to 0.52 mg KOH/g of the feedstock and, the most favourable conditions for the highest yield of esterified oil were found at the molar ratio 8:1, temperature 650C, catalyst concentration 1% (wt%) H2SO4 and the stirring speed of 600rpm for a reaction time of 90th minute. Whereas in the alkali transesterification, the optimum biodiesel (96.6%) was achieved, and promising conditions were recorded at molar ratio 6:1, temperature 60OC, stirring speed of 500 rpm, catalyst concentration 0.3% (wt%) of KOH for a reaction time of 60th minute. The produced algal biodiesel was evaluated in contrast to ASTM standard specification and all the results within standards limit were observed. The Physico-chemical properties of biodiesel-derived crude glycerol samples were also determined and the compositional analysis of crude glycerol was found to be significant in crude glycerol. Besides, the work-out on the effectiveness of capital and operating costs are found to be rational and

this certainly makes algae fuel production commercially viable. However, the novelty of this study is to explore the wild stuff of S.maxima algae from its natural habitat for biodiesel production is significantly cost-effective which is possible by omitting the algal culturing segment in vitro.

Keywords: Spirulina maxima (wild stuff); Chemical characterization; Transesterification; Methyl esters, GC-MS & FTIR; Optimization of Biodiesel; Techno-economic feasibility

A22: Photocatalytic degradation of organic pollutants in water using nanocomopsite of metal chalcogenides

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Wide varieties of organic pollutants are introduced into the water system from various sources. The unabated increase of dyes is the major cause of water pollution which in turn adversely affects the aquatic lives and the ecological balance of our ecosystem. Therefore, thrifty and environmental friendly pollution abatement techniques are highly desired and recommended in present scenario. The photocatalytic degradation is an attractive technique for mitigation of undesirable organic pollutants in water using UV-visible or solar irradiation at room temperature. Present study focuses on preparation of metal chalcogenide based nanocomposite materials for effective degradation of toxic organic dyes into non toxic forms by photocatalysis. Some important characterization techniques were employed for characterizing the nanocomposite materials. Feasibility of the nanocomposite materials in the degradation of organic dyes were assessed and experimental conditions such as contact time, concentration of dye, quantity of nanocomposite, pH were altered to find out the optimum conditions of degradation.

Keywords: Nanocomposite, Characterization, Photodegradation, Dyes, UV-visible radiation.

A23: Impact of Climate Change in our biodiversity

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Biodiversity is the variability among living organisms from all sources, including terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. So far, about 1.5-1.75 million species have been identified, however, scientists estimated that there may be between 10 to 13 million species. Hence majority of species of our planet remains unexplored. Endemism contributes to the uniqueness and special importance of the biodiversity in particular areas. A species is endemic to a certain region if its distribution is restricted to that particular region. The period since the emergence of humans has displayed an ongoing biodiversity reduction and an accompanying loss of genetic diversity. Named the Holocene extinction, the reduction is caused primarily by human impacts. The huge gene pools of various wild and indigenous breeds have collapsed causing widespread genetic erosion and genetic pollution. The climate change is one of the prime factors for loss of biodiversity. Over the centuries surface temperature raised by 0.6 ± 0.2^0C and it is predicted that it would be raised by $1.4 - 5.8\ ^0$C by 2100 AD. Changing climatic conditions and dramatic increases in carbon dioxide will put our ecosystems to the test. Species loss and endangerment are rising along with global temperatures. As many as 30 percent of plant and animal species alive today risk extinction by 2050 if average temperatures rise more than 1.1^0 to 6.4^0C. The current global warming has already caused extinctions in the world's most sensitive habitats and will continue to cause more species to go extinct over the next 50 to 100 years. Climate change has started affecting bear populations. Coral reefs -which are biodiversity hotspots - will be lost in 20 to 40 years if global warming continues at the current trend.

Several measures have been adopted to save our biodiversity from the impact of global warming. Agenda 21 is a non-binding action plan proposed in Rio Earth summit (1992) with regard to sustainable development. The Convention on Biological Diversity (CBD) is a multilayered treaty which has three main goals: the conservation of biodiversity, the sustainable use of its components, the fair and equitable sharing of benefits arising from genetic resources. Under the Paris

Agreement, each country must determine, plan, and regularly report on the contribution that it undertakes to mitigate global warming.

Keywords: Biodiversity, global scenario, biodiversity loss with regard to climate change

A24: A frequent land use land cover changes in the Nilgiris: A challenge to net zero emission and environment protection in the Western Ghats

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The Western Ghats is a fragile ecosystem and one of the hottest biodiversity hotspots in the world, has witnessed major land-use and land-cover (LULC) change in recent times. The conversion of forest and grassland into agriculture and in many places into tea plantations is a common phenomenon. Also, the development of tourism and related industries around the sub urban areas in the Nilgiris are the main cause of wild animals – man conflicts and exacerbate the environmental conditions. The Geographical area of the district is 2545 square kilometers and consists of 6 taluks and a unique feature is that 56% of the total area is under forest. Horticulture (vegetables and plantation crop) occupies 29.6% of area. Among horticultural crops per cent area under tea, coffee, spices and vegetables are 78.6%, 11%, 4% and 6.5%. The Land use land cover contributing for CO_2 in the study area are mainly from different land use systems mainly consisting of Tea Plantation, Natural forests (Shola, Eucalyptus, pine, acacia and mixed forest), agriculture (Carrot-Cabbage-Potato cropping system) and grassland. The study of net ecosystem exchange of carbon fluxes from the eddy covariance tower located at ICAR-Indian Institute of Soil and Water Conservation Research Farm, Udhagamandalam (11^{o}23' 15"to 11^{o}24'6" N and 76^{o}40' 3.96 to 76^{o} 40' 7.29 E; 2218 m above MSL) from 2019 to 2021 indicates that Nilgiris ecosystem behave as a sink to the atmospheric CO_2 with pre-monsoon (summer), monsoon, post-monsoon and winter average NEE of,-1.74, -3.14 -1.82 and -2.13 mmol m^{-2} s^{-1}respectively. Our land use level study on carbon exchange behaviour in grassland also indicates that the grassland

ecosystem behaves as a sink to the atmospheric CO_2. Therefore, stringent forest policies need to be evolved and implemented to protect natural forests and grasslands in the Nilgiris area to protect ecosystem and environment in Western Ghats ecosystem.

Keywords: Agriculture, Grassland, Sholas, Net Ecosystem Exchange.

A25: Remarkably Efficient Sensors for Trace Determination of Emerging Pollutants

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In present scenario industrialization, population expansion, and intensified modern agricultural practices are interlinked to environmental challenges culminating in compromised water quality due to pollution by toxic, persistent, and bioaccumulative heavy metal ions, pesticides, nitroaromatics, and other emerging pollutants. Environmental pollution caused by agricultural chemicals and other industrial products is a great threat to human health and causes economic loss. Considering the detrimental impact of pollutants on human health and ecosystem, their detection in different media including water is paramount. Notably, electrochemical techniques are more appealing owing to their recognized advantages. Mostly electrochemical sensors are the device which are small in size with simple operations and show rapid detection due to this advantage of electrochemical sensors they are cheaper, small size equipment with simple operations and show good flexibility when employed in analyte determination in food, environmental sample and biological fluid analysis. New generation sensors are in tune with the growing need for performing rapid and accurate in-situ analyses and for the development of portable devices and successfully applied for the detection of environmental pollutants up to trace level.

A26: Development vis a vis Environment Conflict-A case study of the State of Jharkhand

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Environmental activism has long back history, being a part of social movement it involves the local resident, groups of activist who collates for the cause of environment, an integral part of the mother earth. Environmental activism always provides an example of collective efforts and empathy towards the nature earth. However it also represents the blue-print of segmental and lopsided developmental approach towards it. Jharkhand the State emerges from the word "JhariaKhanda" ie. Forest land firmly stands as an example amongst one being rich in natural resources. Despite of a very slow rate of developmental index the state had witnessed many detrimental impacts on its rich biotic as well as abiotic resources. Since the population of the state are mostly agrarian and depends wholly and solely on these natural resources, affirmation on the impact on the economy has been witnessed very clearly. Long term sabotage between the nature and its human interaction had thus resulted in many environmental movements which has gained the National affirmation. The present manuscript is a review research on the development vis a vis environment conflict for the State of Jharkhand. The efforts were also made to identify the policy gaps and the impact of such activism on the overall institutional arrangements of the State.

Keywords: Environmental activism, biotic, abiotic, activism

A27: Biodiversity loss: Impact on Emergence of Infectious Diseases

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The biodiversity on Earth is indispensable for maintaining a healthier ecosystem on our planet and for the welfare of human beings. But increasing demands for food, water, land, and energy nature has lead to the destruction of habitats, extinction of animals and plants species, air and water pollution etc. These conditions have created a pressure on nature. The rate of loss of biodiversity has increased up to ten thousand times it was 100 years ago resulting in environmental degradation. Since healthy environment is essential for survival of healthy humans, the ever increasing environmental degradation has produced profound effects on human health. Well-functioning and biodiverse ecosystems are critical source of clean air, fresh water, safe and nutritious food, culture and inspiration for healthy functioning human societies. The existence and management of sustainable natural resources are requisite for the baseline health status of a community resulting in secured livelihoods. Moreover a healthy ecosystem with good biodiversity also minimizes the rise and spread of diseases thus stabilizing the climate.

Declining biodiversity and degrading ecosystems leads to the hampering of essential life-sustaining services. This produces a negative impact on the human health and well-being. According to World Health Organization (WHO), loss of biodiversity is occurring at exceptional rates, affecting human health worldwide. Emergence and spread of infectious diseases are the major negative outcomes. More than one billion human infections with millions of deaths per year are caused by the Infectious diseases globally. Around two thirds of well-known human infectious diseases are shared with animals, and the maximum of newly upcoming diseases are connected with wildlife. There is composite link between loss of biodiversity and infectious diseases. A number of parasites that infect animals can also cause infectious diseases in humans. This becomes a chief problem for food security and human health as confirmed by the Arctic Biodiversity Assessment (ABA). Growth of human population and the loss of large areas of undeveloped land have led to an increased close contact between humans and wildlife, thus providing the opportunity for pathogens to “switch” from animals to humans. This has resulted in outbreaks of several severe diseases like Ebola, SARS and most recently the novel corona virus infection. This problem is of serious concern especially in

populations that depend on wildlife species for food and livelihood. Demolition of habitats by human activities increases our contact with new pathogens leading to emergence and spread of novel human infectious diseases. Hence protection of biodiversity would prevent future outbreaks of infectious diseases in the society.

Therefore, this article provides an overview of the significance of sustainable biodiversity of our natural environments for human health and well-being.

Keywords: Biodiversity, Infectious diseases, Ecosystem, Human health

A28: Global warming and climate change

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Global warming is a gradual increase in the earth's temperature generally due to the greenhouse effect caused by increased levels of carbon dioxide, CFCS and other pollutants.

Global warming is the phenomenon of increasing average air temperatures near the surface of earth over the past one to two centuries. This change has disturbed the climatic pattern of earth. However the concept of global warming is quite controversial but the scientists have provided relevant data in support of the fact that the temperature of the earth is rising constantly. There are several causes of global warming which have a negative effect on humans, plants and animals. These causes may be natural or might be the outcome of human activities. In order to curb the issues, it is very important to understand the negative impacts of global warming.

Manmade causes of Global warming'-:-

1. Deforestation
2. Use of vehicles
3. Chlorofluorocarbon
4. Industrial development
5. Agriculture
6. Over population

Natural causes of Global warming-:-

1. 1.volcanoes
2. 2.Water vapour
3. 3.Melting permafrost
4. 4.Forest blazes
5. 5.Effects of global warming
6. 6.Rise in temperature

7. 7.Climate change

8. Spread of diseases

How can we control Global warming:-

The release of carbon dioxide and other greenhouse gases into the atmosphere is the major cause of global warming. It can be reduced by setting a high price of carbon, increasing the biofuels production from organic waste, use of renewable energy like solar and wind power, safeguarding forests and improving energy efficiency and vehicle fuel economy.

Keywords:- Global warming, increase in Earth's temperature, Greenhouse Effect, causes of Global warming

A29: An Exemplary Montreal Protocol for Climate Mitigation: Antarctica Ozone hole Recovery Perspective

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The threat of manmade emissions to the ozone layer, which shields life on Earth from harmful UV radiation, was recognized by scientists in the 1970s. By the mid-1980s, this threat proved substantially worse than projected, with an extensive and unexpected springtime Antarctic ozone 'hole' appearing due to ODS emissions, mainly CFCs. Under the umbrella of United Nations Environment Programme (UNEP), the world's nations first negotiated a framework convention, the 1985 Vienna Convention for the Protection of the Ozone Layer, in response to scientific evidence that man-made chemicals, CFCs, posed a severe threat to stratospheric ozone. They then added a regulatory agreement, the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer, in response to new scientific evidence that confirmed the Antarctic 'ozone hole'. Since the inception of the Montreal Protocol, there is strong evidence that this treaty has performed effectively in containing the Ozone depleting substances, which in turn resulted in phasing out 98 % of hydrochloro fluorocarbons (HCFCs) compounds globally compared to the 1986 levels. The Montreal Protocol has been continuously evolved as a strong global environment policy in mitigating the ozone depletion caused by the emissions of chlorine and bromine contained CFCs and recovery of the ozone layer. There exists strong evidence on the successful implementation of the Montreal Protocol, which controlled the thinning of Ozone over the Antarctica region since its inception in 1985. Towards this, we observed the rate of change of the total column ozone (TCO) across the globe, with an emphasis over the Antarctica region using four decades (19792020) of satellite measurements. The present study revealed that the trend levelled out for decades and then gradually reversed, resulting in the observed increase in Ozone. The significance of the present result lies in providing the decadal trend in Ozone, which in turn plays a vital role in societal applications. These Montreal Protocol-related actions represent exemplary policy cooperation, which is crucial for acting on climate change.

A30: Evironmental conflict of human surviving in the sinking island of Ghoramara

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The island of Ghoramara is located in the mouth of river Hoogly about 30kms from the north of Bay of Bengal. Now it has an area of 6.7 sq.km. because in the last 30 years it has nearly lost 75% % of its total area and out of seven villages, one is completely submerged. The island right now is inhabited by around three thousand people and the main cause of erosion being the retreating water during low tide as because the diaphragm wall of the Haldia port pushes the water onto the western side of the island. The main problem in this stage is aggravated by the consecutive cyclones like Fani (2019), Bulbul (2019), Amphan (2020) and Yaas (2021). As a result of which there has been severe tidal wave and infestation of saline water into the central part of the island. In this investigation, the soil has been tested for salinity along the longitudinal stretch, the periphery has almost 14% and comes down to 4% towards the centre. Certain microbes have been isolated, and identified as Bacillus sp. like Bacillus megaterium, Bacillus aryabhattai, Bacillus altitudinis and Arthrobactersp which show appreciable saline tolerance. Based on their PGPR activity they have been used to restore the soil fertility and the initial result indicated that the agricultural land which used to remain non-productive for one year can regain its fertility within six months. The paddy grains are filling up again. Hence, though this island is going to sink one day because of the global warming issues but at least by manipulating the microbial consortia the agricultural scenario can be improved and this will enable the villagers to grow their food and survive on their own.

Keywords: Ghoramara, Cyclones, Saline infestations, PGPR Activity.

A31: Study of different species of environmental friendly Gladiolus for Indian conditions

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The modern gladiolus cultivars offer a diversity of colors, shapes and sizes. Its beautiful inflorescences have a long lasting blooming period and make it an important cut flower crop. It is used as border plant, pot plant, for bedding purpose in gardens and for display and as a cut flower. Mostly corms and cormlets are used as plant propagation material. Seed propagation is used in hybridization programmed only. Its cultivation is more paying particularly around big cities because of its ready market. In India farmers raise gladiolus during March-April in the hills, Sept-October in the plains and throughout the year in Bangalore region of Karnataka. Owing to the increase In trade related to tourism, rapid industrialization, developing trends for social and business gathering, improved economy and change in taste, urge for modern and sophisticated living, use of these attractive but flowers has become an integral part of living. Thus, there is an ever-increasing demand for gladiolus flower.

The improvement in gladiolus has remained more or less stationary in India in the recent past due to non-availability of germplasm of divergent forms. However, the universal approach in its breeding has been unidirectional in most of the countries. For making further improvement in number of florets per spike, there have been consistent efforts on the part of breeders and floriculturists in the cultivated gladiolus for the characters attributed to number of florets per spike. In starting and improvement therefore it is essential for plant breeder to assess the population available from this point of view, as there is no report on variability estimates over different environments. Improvement of plants depends upon the magnitude of genetic variability of different quantitative characters. Therefore the measurement, evaluation and manipulation of genetic variability in desired direction become extremely important in any yield improvement programme.

A32: Soil Microbes: A Key Player On Soil Health And Crop Production Under Changing Climate

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Climate is one of the main drivers of organism growth and species distributions; thus, a changing climate has the potential to alter the composition of plant and soil communities and the interactions between them. Soil microorganisms represent a fundamental role in soil health and sustainability. Microbial population density and diversity are stirred by the level of organic matter indirectly by providing energy for soil micro-organisms, improving soil moisture, soil structure and stability, plant nutrient availability and forbid soil-borne disease incidence. Crop production and soil management practices designed to hold soil microorganisms i.e. minimum tillage, composting, cover cropping, eliminating fertilizer and pesticide use and maintaining biodiversity, will inevitably lead to soil improvements and stability. The need for replenishing organic matter in the soil after harvesting is thus of great importance. In ecological farming systems, organic matter is maintained by mixed farming, rotations, recycling, compost and farm yard and green manures and bought-in organic sources. Including legumes and cover crops in the rotation should help balanced soil fertility, disease management, and avoid leaching nutrients and soil pollution. Crop and soil management practices designed to support soil microorganisms have been shown to lead to improvements in soil structure and stability. Although the great diversity of soil microorganisms is now well appreciated, studies over the past twenty years have established that several other soil organisms, apart from mycorrhizal fungi, not only play an active role in suppressing pathogens but also mediate the activity of a range of beneficial organisms. Apart from farming in ways that support indigenous microbes, the use of effective exotic cultures of beneficial microorganisms as soil and compost amendments, root dips, feed additives or sprays to supplement or reinforce the indigenous micro-flora are being considered.

Keywords: Soil Microorganisms; Health; Sustainability; Mycorrhizal; Fungi.

A33: Influence of foliage ornamental plants on Indoor Air quality

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Due to rapid urbanization and technological developments, peoples used to be in indoor for maximum hours than in outdoor. Hence, indoor air quality is considered as an important criteria for the well being of humans. Further, presence of more CO2, decreased humidity, less accumulation of PM increase ozone levels ends in harmful effects resulted in sick building syndrome. Printing industry is fast growing industry in the globe with multicoloured fascinated outputs. The materials used for printing are solvents such as ethanol, toluene, ethyl acetate, isopropanol, n-propanol, hexane, toluene-xylene-naphtha mixture, methyl ethyl ketone, isopropyl acetate, n-propyl acetate, glycols and other glycol ethers. At higher levels of usage this may leads to modify the indoor air quality. Plants are found to remove toxic gases in the indoor atmosphere. It is well documented that plants in indoor space not only add aesthetic value, but contribute and promote the improvement of indoor air quality. Hence, this present study was taken up with an objective to study the impact of foliage ornamentals on Indoor air quality in Digital printing unit. In this experiment, two indoor foliage ornamental genus viz., Codiaeum variegatum and Dieffenbachia were tested in the digital printing unit. Six plants of each genus were separately placed in the experimental unit (10 x 10 x 12 feet printing unit) for three days. Preliminary data was observed without plants and kept as control. The indoor air quality was monitored on hourly basis by smart air monitor and the data on temperature, humidity, CO2, PM 2.5, carbon monoxide and ozone were recorded and analyzed.. It is evident from the experiment that both the foliage ornamentals viz., Codiaeum variegatum, Draceana reflexa and Dieffenbachia improved the indoor air quality placed in the digital printing unit. However, among the three genus, Dieffenbachia recorded more positive effect in modifying the indoor air during the experiment period.

Keywords: Indoor air quality, Plants, humidity, CO2, PM 2.5, carbon monoxide and ozone

A34: Groundwater quality studies with special reference to fluoride and its removal by usingactivated seed biomasss of Prosopis cineraria Linn. as biosorbent

Dasaiah Srinivasulu

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Groundwater is one of the primary resources for drinking and irrigation in Wanaparthy district of Telangana, India. However its quality is deteriorating due to population growth, rapid industrialization, agricultural runoff and urbanization. The main objective of this study is to establish the groundwater quality with special reference to fluoride and its remediation by using activated seed biomasss of Prosopis cineraria Linn. Asbiosorbent. To achieve the objective, 64 groundwater samples collected from various rural habitats of Wanaparthy district, Telangana State and analysed for physico-chemical parameters with special reference to fluoride. Fluoride levels in various locations found to be exceeds in WHO limits which are posing threat to public health. In search of fluoride removal methods, biosorption with locally available plant-based materials found greater interest. Batch experiments carried out with the operating parameters such as pH, adsorbent dose, contact time, initial fluoride solution, and temperature in such solution influence the degree of fluoride ions adsorption by using activated seed biomasss of Prosopis cineraria asbiosorbent. The characterization studies carried out with surface morphology and functional groups responsible for fluoride biosorption was evaluated by scanning electron micrograph(SEM) and Fourier Transferred Infrared spectroscopy Experimental results and characterization studies revealed the suitable morphology and functional groups on the surface of the biosorbent. Efficiency of novel and alternative biomass for the removal of fluoride. The present findings suggested activated seed biomass of Prosopis cineraria also considered an alternative, inexpensive and effective biosorbent for the removal of fluoride.

Keywords: Batch experiment, Biosorbent, fluoride, Groundwater, pH.

A35: Microbiome engineering strategies for enhanced bioremediation of petroleum hydrocarbon contaminated environments

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Petroleum hydrocarbon (PH) contamination of different environments is a global concern. PHsare heterogenous mixture which include saturated hydrocarbons, aromatic hydrocarbons, asphaltenes etc, and often present with other co-contaminants such as heavy metals. Microbial degradation of crude oil is efficient, affordable, and environmentally friendly strategy. Bacterial communities present in the contaminated environments have catabolic pathways for hydrocarbon degradation. Though the effectiveness and abundances of such functions may vary. The NGS based community analysis allows us to characterize whole microbiomes of contaminated environment with information on unique metabolic pathways used by the microbial community to degrade these contaminants. These pathways may be targeted for through microbiome engineering techniques for improving the bioremediation efficiency. There are several methods suggested to achieve this, including supplementing desired genes for pathways, and bio-stimulation. Further, CRISPR-cas and other tools for genetic engineering may provide an innovative insight for altering the microbiome through genetic interactions. In this lecture, modulating the microbiomes through microbiome engineering will be elaborated for desired catabolic functions with the perspective of bioremediation of hydrocarbon contaminated environments.

A36: Engineering tailored nanostructure of Serendipita indica: quo vadis?

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In the quest for less toxic and cleaner methods of nanomaterials production, recent developments in the biogenesis of nanoparticles have emphasized the significant role of microbes. Their intrinsic ability to withstand variable extremes of temperature, pressure, and pH coupled with the minimal downstream processing requirements provide striking route for diverse applications. In this research findings, we critically analysis the advances in nanoparticle synthesis using Serendipita indica (Synonym Piriformospora indica), and discuss new insights into the cellular mechanisms of such formation that may, allow complete control over particle morphology and functionalization. In addition, to serving as paradigms for cost-effective, biocompatible, and eco-friendly approaches, fungus hold the promise for a unique template for synthesis of tailored nanoparticles targeted at therapeutic, environment and diagnostic platform technologies.

Keywords: Toxic; Cleaner production; Tailored nanoparticles; Eco-friendly; Environment

A37: Antioxidant and Antimicrobial Activities of some Essential Oilsfrom Agrihorticultural Wastes

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Food processing industry and post-harvest produces large volumes of wastes that pose severe pollution problem, loss of valuable biomass and nutrients. Such wastes might have a potential for conversion into useful high value by-product, or as raw material for other industries after treatment. The management of such waste like leaves, flower and residual aerial parts from Allium cepa (Onion), Brassica campestris (Mustard), B. oleracea (Cauliflower), Capsicum annum (Mircha), Citrus sinensis (Orange), Citrus lemitta (Mausami), Coriandrum sativum (Dhania), Cuminum cyminum (Jeera), Foeniculum vulgare (Saunf), Helianthus annus (Sunflower), Sesamum indicum (Til) and Trigonella foenum-graecum (Methi) were studied for their essential oils (EOs), total phenolic contents (TPC), antioxidant (AOA) and antimicrobial activities. The EOs extracted through hydro-distillation varied from 0.05 to 1.13%, TPC determined as mg/g Gallic acid equivalent (GAE) were 4.0 to 57.5 mg/g GAE Allium cepa (variety violet) and AOA varied from 20.4 to 70.8% Allium cepa variety violet. Antioxidants provide protection from damage caused by reactive oxygen species and lipid peroxidation, to protein, enzymes and DNA damage. The samples with promising EOs, TPC and AOA were also studied for their antimicrobial activities. The antimicrobial activity was also assessed against some major plant pathogens and the highest zone of inhibition (30.0 mm) was produced by citrus peel oil against Staphylococcus aureus followed by Allium cepaviolet variety (27.0 mm). Amongst the fungi, the highest zone of inhibition (18.0 mm) was produced by Coriandrumsativum EO against Acremoniumsp. Thus, present studies suggest that agri-horticultural wastes may be cost effective source of antioxidant and antimicrobial phytochemicals that can play important protective role in various ailments.

Keywords: Agri-horticultural wastes; Essential oils (EOs), Antioxidant activity; Total Phenolic contents (TPC); Free Radical Scavenging Activity (FRSA)

A38: Is Utilizing Biomass for the Green Production of Metal Nanoparticles Merely a Scientific Curiosity or a Viable Substitute for Chemical Synthesis?

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One of the most serious issues facing the world today is the pollution, which is getting worse every year having catastrophic and destructive effects on the environment. Currently, the most common environmental health hazards pollutants include carbon monoxide (CO), chlorofluorocarbons (CFC), volatile organic compounds, hydrocarbons, and nitrogen oxides (NO). All these organic and inorganic pollutants can damage both the water and soil environments; this is mainly due to the careless and mismanagement of sewage water, uncontrolled applications of pesticides and chemical fertilizers, oil spills and most importantly industrial effluents. Thousands of tons of metallic nanoparticles (MNPs) are currently generated and used in agricultural, personal care, medical, food, and nano-enabled devices. It is widely accredited that MNPs cannot be produced industrially using chemical reaction methods that are known to be hazardous to the environment. Green synthesis of MNPs can be used as an alternative way to reduce the use of hazardous substances upon synthesis of MNPs resulting lowering of pressures on environmental quality. In this milieu, investigators have developed the green synthesis methods utilizing several types of reducing agents including organic molecules, microorganisms, plants, and plant-derived materials. Every year, a number of research articles are published, and each one emphasizes the advantages of the green approach over conventional syntheses, but no stoichiometric calculations or a clear mention of the reducing factor can be found in the majority of the published papers. However, the questions remain unanswered like: how much biomass is required to produce a specific volume of MNPs (i.e., ratio of reducing agents and MNPs synthesized)? What is the best type of biomass for synthesis of particular MNPs? What are the standardized conditions for the production and stability of monodispersed MNPs? What is the true molecular mechanism underlying MNP synthesis? Unless these concerns are resolved, the green synthesis of nanomaterials is a scientific curiosity rather scaling up to industrial levels. This is why, nearly two decades after the explosion of news about the novel technique i.e., green synthesis, it

does not seem that commercial production of green-synthesized nanoparticles has found a method to scale up.

Keywords: Metal nanoparticles, green synthesis, pollutants, industrial effluents, scaling up, sustainability.

A39: Resolution of Environmental Conflict by Green Audit-- A Must for Today

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Green Audit is a tool that organizations use to identify the extent of environmental conflicts, degradations and its impacts. In the present day's world, the statutory authorities make it mandatory to assess the status of establishments. It also offers the compliance with applicable laws and regulations, as well as with the expectations of stakeholders. It is a means to identify opportunities to save money, improve health, safety and process efficiency, to increase revenue generation and reduce liabilities.

The Green Audit was mandatory for industrial establishments, but presently it became equally applicable for general establishments as well. According to National Assessment and Accreditation Council (NAAC) Green audit is assigned to the criteria 7 for an academic institute in order to getting a good grade of NAAC according to the scores assigned during the accreditation.

We are celebrating 75 years of Indian Independence. Indian civilization is Village Centric, Govt. of India's policy highlights the upgradation of Indian Villages into Smart Villages. Open defecation, drinking water scarcity, lack of adequate infrastructure, education and health care, access to basic amenities, power shortage are the major challenges which need to be eradicated to ensure the status upgradation. Green Audit is a very helpful tool to ascertain exactly where the Indian villages stand.

In the present paper the methodology of conducting Green Audit for different Cluster of establishments has been discussed. All the major components Viz. Air, Water, Solid Waste, Noise, Live- Stock, Energy, Carbon Emission Reduction strategies, Optimum utilization of resources and mode of revenue generation have also been adequately reported with few illustrative case studies.

Keywords: green audit, Components of Environmental Audit, carbon emission reduction strategies, environmental conflict resolution, smart villages.

A40: Nutrient budgeting using NUTMON –model for Sustenance of Soil Fertility in Humid Tropical Kerala

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Mining of nutrients from soil is a major problem causing soil degradation and threatening long-term food production in developing countries. Decision Support Systems (DSS) / models are interactive computer software that help decision makers utilize data and models to solve unstructured problems. In this paper an attempt was made using NUTMON model for carrying out nutrient audits, which includes the calculation of nutrient balance at micro (plot/field) and meso (farm) level and evaluation of trends in nutrient mining/enrichment. A nutrient budget is an account of inputs and outputs of nutrients in an agricultural system. NUTrientMONitoring (NUTMON) is a multiscale approach that assess the stocks and flows of N, P and K in a well defined geographical unit based on the inputs viz., mineral fertilizers, manures, atmospheric deposition and sedimentation and outputs of harvested crop produces, residues, leaching, denitrification and erosion losses. The nutrient budgeting study was carried out using the NUTMON model for 2 farms in Palakkad district by adopting the standard procedures and calculations (viz., 1.Organic 2.Integrated nutrient management (INM)). The calculated nutrient balances at crop activity level indicated a negative balance for nitrogen, phosphorus and potassium in crops like paddy, coconut, arecanut and banana. At farm level, the integrated nutrient management farm showed N balance as negative, whereas P and K balance was positive. The organic management farm showed a positive balance for N, P and K. The results revealed that the nutrient management practices are not appropriate and sustainable in INM farm. The management options to mitigate this mining by manipulating all inputs and outputs in a judicious way with an integrated system approach are suggested and discussed.

Keywords: Nutrient balance, Inputs, Outputs, Fertilizers, nutrient mining, NUTMON

A41: Integration of functional biomaterials with micro– and nano-systems for sensing and actuation technologies

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Electrochemical lab-on-a-chip biosensing devices are translational and mobile analytical micro-systems that enable rapid and label-free analyses of redox-active biomarkers, bringing benchtop medical diagnostic methods to the point-of-care. However, the selectivity of electrochemical biosensors towards the biomarkers-of-interest dramatically decreases in the presence of biofluids due to other redox-active molecules generating masking electrochemical signals, requiring pretreatment steps to filter the interfering molecules and limiting the biosensor's real-time analysis capabilities. Thus, engineering new electronic surfaces for the biosensors that would improve the signal-to-noise ratio of the electrochemical signals generated by the biomarkers and could be easily integrated in electrochemical lab-on-a-chip, would make a significant contribution to real-time measurement of various redox-active biomarkers in the body in health and disease, and would find utility in a wide range of biomedical applications, from in vivo diagnostics to in situ screening of drugs. In this work, we demonstrate the beneficial use of a stimuli- responsive biopolymer chitosan to modify electrodes using a controlled biofabrication scheme with a high spatiotemporal resolution that enables integrating functional bioelectronic surfaces in a microfabricated lab-on-a-chip. We use the functional biomaterials-integrated lab-on-a-chip to rapidly probe redox-active biomarkers in biofluids without pretreatment steps in three modes of detection: (1) detection of a specific biomarker, (2) influencing masking signals that interfere with the biomarker's detection, and (3) simultaneous detection of multiple specific biomarkers. We develop these modes of detection by modifying the surface of the electrodes with redox-responsive films to amplify the oxidation current generated from the biomarker and decrease the required over-potential to shift the overlapping signals generated by other redox molecules in the biofluid. Nano-biofabrication of films with unique electronic characteristics for seamless integration in biosensing micro-systems will enable rapid and low sample

volume analysis of markers and will hopefully improve personalized health monitoring.

Keywords: Sensing and Actuation Technology; Biosensor; Integrated devices; lab-on-chip technology, Point-of-care.

A42: An Overview of the natural calamities, especially hydrologic implications by the climate change during the last few decades.

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Anthropogenic emission of Green House gases and deforestation are the main causes of climatic changes on the planet. The role of climate is not only important for the meteorological parameters but regulates the natural cycles on the earth and life style of human being. Any minor change in the climate can affect the whole earth's ecosystem. Climate change is a change of climate which is directly or indirectly controlled by the human activity that can alters the composition of the global atmosphere and which is in addition to natural climate variability, observed over comparable time periods. According to the International Panel on climate Change (IPCC) report from the early 1700s, carbon dioxide (a greenhouse gas) has increased from 280 parts per million to 417 ppm in February and March 2021. and it has been observed that it was 50% projection in the CO2 from the preindustrial area. Many scientists believe that higher concentrations of carbon dioxide in the atmosphere will enhance the greenhouse effect making the planet warmer. Most computer climate models suggest that the globe will warm up by 1.5 - 4.5° Celsius if carbon dioxide reaches the predicted level of 600 parts per million by the year 2050. Changes in the atmospheric abundance of greenhouse gases and aerosols, in solar radiation and in land surface properties alter the energy balance of the climate system. The atmospheric warming and cooling variations associated with El Nino and La Nina events of the Pacific Ocean and are called as Southern Oscillation. It is believed that La Niña's cooling of the equatorial Pacific tends to favors hurricane formation in the western Atlantic. In contrast, El Niño conditions tend to suppress the development of tropical storms and hurricanes in the Atlantic, but increase the number of tropical storms over the eastern and central Pacific Ocean. The Asia/Pacific region is exposed to a range of climate conditions and extreme events. In particular, some of the key features of the region's climate are the influences of the El Niño-Southern Oscillation, and cyclones on rainfall. India has a monsoon dominated rainfall pattern. Indian South-West monsoon and North-East monsoon, cyclonic depressions and western disturbances, destructive local storms and frequent cyclones

contribute to changing in rainfall pattern by various degrees in some selected regions of India and Asia.

The talk will cover:

1. The impact of different types of natural activities in pacific ocean on environment

2. Modulation of current El Nina and La nina pattern.

3. Multiple factors for natural disasters reviews their trends, and assesses the potential impact of changing climate on hazards and extreme events in Asia and Pacific region.

Keywords: Climate change, El Niño, La Nina, Southern Oscillation, natural disasters.

A43: Relationship between Environment and Technology

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Board of Director AMCHAM American Chamber of Commerce According to the "paradox of technical growth", technology has two different relationships with the environment: The environment has been affected by technology in a way that has never before been seen, mostly due to productivity gains that made it possible to significantly boost output (and consumption). However, technical advancements have simultaneously increased the availability of economic and technological treatments. The three mechanisms by which technology has a positive impact on the environment are as follows: (1) technological substitution processes increase the effectiveness of production modes and the use of goods and services at any given time, opening up new opportunities for overcoming constraints such as resource scarcity and depletion (2) some technologies, such as satellite technologies, that do not enter any substitution process (they do not directly replace any old technology), can be qualified as "natural resource augmenting," e.g., enabling the discovery of new hydrocarbon or water reservoirs; and (3) technological change, or rather changes in a host of interrelated technologies, could (at least in principle) offer reductions in the resource, materials, and environmental intensiveness of industrial societies that are not only marginal, but rather are by orders of magnitude. The challenge in using technology advancement to address environmental issues is that it cannot be restricted to the energy and natural resource industries. Technology must be viewed holistically because the issue at hand ultimately relates to changing social behaviours, consumption habits, and lifestyles. On the other hand, new technologies (such information and communication technology) may have a significant impact on, instance, commuting and transportation, and may thus help find answers. However, it is fair to say that a change to a completely new techno economic "paradigm" seems necessary given the myriad environmental issues at play and the fact that more than two-thirds of the world's population still aspire to the resource- and environment-intensive lifestyles of the wealthy industrialised countries. It's becoming increasingly important for technology to serve as a tool for studying human-environment interactions and, eventually, for replacing accidental "experiments" with simulation. It is possible that a

new mode of knowledge generation is emerging as a result of the ability to use simulation in place of actual experimentation in the nuclear weapons field or to speed up technological research by increasing the use of simulation at the expense of prototype development (for example, as was done for the Boeing 777). One of the question to be addressed is "how can society overcome technical inertia and lock-in to speed up the transition toward new (still unclear) technology and institutional configurations that are environmentally more compatible".

A44: Effect of Climate Change on the Environment & Human Life

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Global warming is a phenomenon with global impact and therefore becomes an international issue. Every individual an organization or a Nation contributes in some way or the other cumulatively to make it a global issue of significance. The small problem over the period can take the shape of an evil big enough to engulf and damage the whole world. All the countries are aware that the recent reports about "Global Warming "have given perhaps the last warning and has shown a red signal to the whole world. The rising temperature has threatened the very existence of the Universe, mankind, birds, cattle wealth, beasts, forests. etc. Various countries have initiated action to face the grave effects of the Global Warming.

Impact highlighted by the fourth assessment report of intergovernmental panel on climate change IPCC 2007 include- widespread melting of glaciers and snow cover will reduce melt water from major mountain ranges (Hindu Kush, Himalaya, Andes) where more than one billion people currently live. In 2008 alone more than 20 million people were displaced by sudden climate relation disasters. An estimated 200 million people could be displaced as a result of climate impact by 2050. Researchers at Harvard medical school said that kidney stones, malaria, depression and respiration illness may increase with global warming worldwide.

Global warming refers to the increasing temperature of Earth's surface, including land, water and near surface air.

Atmosphere: The atmosphere is broadly divided into four regions. It extends up to 300 km with temperature varying from a minimum of -20 °C to a maximum of 1200 °C. The troposphere has a particular set of physical properties including temperature, pressure, humidity, precipitation, sunshine, cloud cover. Greenhouse gases act somewhat like the glass panes of a green house. They allow light, infrared radiation, and some ultraviolet radiation from the sun to pass through the troposphere. Earth's surface absorbs much of this solar energy and degrades it to longer wave, infrared radiation- that is heat- which then rises into the troposphere.

Eighty-eight percent of (non-biomass) world energy needs are supplied by fossil fuels while the balance coming from hydroelectric generation and

nuclear power plant. Nearly 70% more carbon is released per unit of energy when coal is burnt instead of natural gas.

To reduce carbon emissions is to switch from coal to oil or natural gas. Gas based power plant emits 42% less carbon than a power plant based on coal. Experiments reveal that most of the carbon in the world is storage in large layer of ice on the poles. The increasing temperature are Melting ice, which is bringing old Bacteria and viruses back to life which could cause epidemics never seen before. As the world gets warmer these bacteria are breaking down long term stores of carbon from the soil as the sources of energy and producing CO_2 as a byproduct. This CO_2 would enhance the global warming effect.

Location of evergreen forests near the equator as well as polar coniferous forest are shifting fast. Global warming has adverse effects on the habitat of different species. Global conservation institute studied 40,000 species and found 16000 of them to be endangered. III effects of climate change have not spared animal kingdom. Many spe. of frog in Costa Rica in south America have become extinct. The habitat of polar bear, reindeer and walrus in arctic region is contracting rapidly because of melting ice.

The adverse effects of climate change on agricultural sector will be more prominent on farming community Rainy season is bound to change with the reduction in duration and possibility of heavy rains in short spells. It is feared that the productivity of wheat may be reduced by 10 to 40% by the year 2100. the productivity of cereals in India may be reduced by 15% in future. Dry spells during the rainy season will have adverse effects on the production of paddy.

The African continent is turning into a desert and this desertification of Africa would reach India and it is feared that the Maharashtra, Madhya Pradesh, Orissa and Gujrat would be total deserts in near future. The water table is Deeping down very rapidly. This is particularly so in Africa, China, India and North America.

Mrs. Brookland, The Prime Minister of Norway was heading a committee to study the problems of Africa and Asia. Its findings are alarming. It seems there is not a drop of drinking water in Ethiopia, there is no food in Somalia and people there are dying for want of water and food.

Furthermore, global mean sea level which has risen 10-15 cm in the last century may raise by another 10-20 cm by 2025 and 50-200 cm. The countries most at risk are the river delta areas of Bangladesh, India, Egypt, Thailand and China.1 Meter rise an ocean level by 2035 would cause. The seas to move 30 meters (100 feet) farther inland along many portions of

our nation's coasts. Twenty percent of most populated areas of India and Bangladesh would be inundated

The effect of climate change could be noticed by several recent calamities. In 2010 Haiti earthquake in 2010 caused 1,59,000 people dead with great damage of property. Constantly number of floods, cyclones and hurricanes are noticed in different parts of the world. Typhoon bhopa in Philippines in 2012 affected 2000 villages. 80,000 people were homeless. Uttarkashi particularly in Chardham Yatra, flood cloudburst and landslides killed thousands of people on way to yatra causing damage to Kedarnath temple affecting 20,000 people and cutting 80 villages of Uttarkashi from rest of Uttarakhand.

• Effects on Ecological Systems

Ecological systems are changing and modified as a result of climate change. About 20 to 30 % of plant and animal species assessed so far are likely to be at increased risk of extinction. Water shortages will put increased pressure on forestry and agriculture. Locations of evergreen forest near the equator as well as polar coniferous forest are shifting fast.

Global warming has adverse effect on the habitat of different species, their number, genetic and exterior compositions. Rainy season is bound to change with the reduction in duration and possibility of heavy rains in short spells. Some areas may face threat of drought and the others may face flood. Indian Agriculture will be greatly affected in coming 20 years. IARI study indicated that the overall wheat output due to climate change could be reduced from the projected 4-5 million tons to nearly 1-2 million tons. Heavy rains and dry spells during rainy season will have adverse effect on the production of paddy. Mango is most sensitive to climate change, amongst all Alphonso is extremely sensitive to climate change. Therefore, it is first to get affected as cold climate is needed for the blossoming of Alphonso mango.

Ecological systems are changing and modified as a result of climate change. A typical example is the coral Reef Ecosystem; coral bleaching resulting from the breakdown of the symbiotic relationship between corals and unicellular algae is often caused by the sea temperature.

The mass bleaching events reported on the Great Barrier Reef and elsewhere around the world over the last 5-10 years due to high water temperatures. Increased levels of CO_2 in the sea also affect the acidity of the ocean's surface water, and hence reduce the amount of dissolved Carbonate for Reef building corals.

Global Warming is the last warning and red signal as there is constant increase in mean global temperature air and ocean. The rising temperature

has threatened very existence of universe, mankind all living creature and plants.

Impact highlighted by the forth assessment report of intergovernmental panel on climate change. IPCC 2007 states that global warming is unequivocal.

Seasons are changing and no. of calamities on the earth such as floods, earthquakes, typhoons are on increase under spread melting of glaciers and show cover will reduce from mountain ranges Hind Kush, Himalaya and Andes. IN 2008, 20 million people are displaced, estimated 200 million could be displaced by 2050.

Our environment has allotted a limit to everything it owns. It does fulfill our needs but with the standard of life undergoing a dramatic transformation the biosphere has started to change.

A new advocacy and public health movement is needed urgently to bring together governments, internet agencies non-governmental organizations, communities and academics. Any adaptations should sit alongside the need for primary mitigation for the reduction of greenhouse gas emissions. Here are some of the actions sustainable for global warming

• Action Strategies for sustainable management

1. Control population growth.
2. Conserve natural resources like water forest and soil.
3. Compost, Recycle, Reuse at least 60% of matter.
4. Plant trees as every tree absorbs 20 tons of CO2 annually ant emit 14 tons of Oxygen.
5. Shift to more dependance on locally available renewable energy from sun, wind, flowing water and biomass.

1. Control Population Growth

   World population has more than doubled in only 44 years, from 2.5 to 6.5 in 1950 to 5.6 billion in 1994. It has reported as 8 billion on 13th Nov 2022. Population explosion degrades the environmental population, poverty and pollution coexist.

2. Conserve natural resources like water forest and soil.

   Conserve natural resources like water, forests and soil natural resources. At present world environment is suffering critical stores not any by our utilization of its natural resources but also the

environmental damage due to deforestation, species loss and climate change.

3. Compost, Recycle, Reuse at least 60% of matter.

   Compost, recycle and reuse at least 60% of matter. Recycle paper plastic, newspaper, glass and aluminum cans. BY recycling half of your household waste, you can save 2400 pounds of CO2 annually 5000 compressed biogas plants will be setup to turn municipal and agriculture waste into energy shift to more dependance on locally available renewable energy from sun, wind flowing water and biomass.

4. Plant trees as every tree absorbs 20 tons of CO2 annually ant emit 14 tons of Oxygen so it acts as carbon sink due to bio sequestration. Forests are home of 50-90% of earth species and are potentially renewable resources however forests especially tropical forests of U.S., Canada and Asia are disappearing faster, Clearwood for timber, paper pulp, wood and forest products.Forests play crucial role in regulation of global climate and temperature as the forest cover absorbs the solar energy for the production of food, otherwise it is reflected back into the atmosphere by bare surface of the earth.

5. Shift to more dependence on locally available renewable energy from sun, wind, flowing water and biomass.

With the increase in population demand for water consumption increased by 2.4% per year. Water should be stored in reservoirs and rain water should be harvested. Between 25-50% of the total runoff water in every continent is now captured and controlled by dams and reservoirs many large projects are planned. Also, every year 6000 million tons of top soil is lost by erosion advisable for farming. Switch over to energy efficient LED bulbs helped to save 38-million-ton news of carbon emission.

Solar Energy:

India is travelling unparallel journey no. projects as undertaken. Indian prime minister proposed the one sun, one world, one grid initiative in Oct 2018. United Kingdom and India agreed to merge their green grid initiation. About 83 ISA member nation have endorsed the initiation.

Global warming problems is dealt seriously various new projects started by all the nations. Environment and forest minister is renamed as Environmental, forests and climate change. Energy if converted to H2 can be stored in better way cera week global energy and environment leadership award is conferred on Indian P.M. Shri Narendra Modiji in March 21. Solar thermal energy is cheaper as compared to electrical

storage. For his leadership for promoting solar energy and elimination of single used plastic P.M. Modiji was honored with 'Champion of Earth' Award by United Nations in 2018.

Solar cars, solar boats are now manufactured. Most recent one is the discovery of solar impulse aero plane with 1700 solar cells which took a successful flight from Switzerland airport on 2nd June 2014 for 13 minutes. India also sent 36 satellites from Shriharikota ISRO on 24th Nov 2022 (Diwali day). Many appliances are now manufactured on solar energy cochin international airport recognized for becoming the first airport in world to run entire operation on solar energy.

Every citizen of the world should contribute to counter the Global warming. Follow the small tips:

- Travel by trains not-cars
- Use LED Bulbs
- Use solar Energy
- Do not waste food water and electricity
- Conserve rain water
- Reduce the use of air conditioners
- Plant trees
- Control Population Growth

The only way to combat the calamity of global warming is the call for United Efforts of the people, resolve and determination of the government, constant awakening of us all and a movement with public participation.

Everything must use its resource wisely to sustain civilization for as long as possible.

A45: Dioxane as an emerging air contaminant: State of the science

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There is no current and flow research on 1,4-dioxane in the air; in any case, posted research has been acted in the USA, and impacts demonstrated that concentrations went from 0.005 to 0.11 µgm-3. Thus, additional research is required before significant conclusions can be drawn. ,4-dioxane has been classified as an "emerging contaminant or contaminant of concern" following investigations into disease caused by 1,4-dioxane at legacy sites. In the past, closed dry-cleaning centers were re-examined for this poisonous, volatile, and water-soluble contaminant because 1,4-dioxane was utilized as a solvent stabilizer for chlorinated solvents like trichloroethane. Even though 1,4-dioxane is labeled as a volatile compound with a boiling point of 101°C, it is not well suited for standard VOC analyses like purge and traps. Because of its high polarity, GC-MS is difficult to extract using traditional liquid-liquid partitioning methods. The analytical chemist will have difficulty obtaining the regulatory authorities' sub-ppb reporting limits.

Keywords: Air contamination; Human exposure, community response; Indoor air pollution; Protective air concentration

A46: Management of Depression using Psychobiotics

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In the pathophysiology of depression, the intestinal microbiota plays an important role. The microbiota influences the shape and modulates the functioning of the gut-brain axis. The intestinal microbiota plays a significant impact on processes related to the myelination of neurons in the prefrontal cortex, and neurotransmitter synthesis, and is also involved in the development of the amygdala and hippocampus. Intestinal bacteria are a good source of vitamins, which leads to exacerbation of depressive symptoms and is also related to the response to antidepressant therapy. In periods of excessive activation of stress reactions, the immune system also plays an important role which negatively affects the tightness of the intestinal barrier and intestinal micro-flora. In this, we have summarized the role of the gut microbiota, metabolites, and diet correlated to depression. We also describe abnormalities in the functioning of the intestinal barrier which is caused by increased activity of the immune system in response to stress. Moreover, the presented study discusses the role of psychobiotic in the prevention and treatment of depression through their influence on the intestinal barrier, immune processes, and functioning of the nervous system.

Keywords: Probiotics, microbiota, Psychobiotics, Human health

108th INDIAN SCIENCE CONGRESS
3 – 7 January, 2023
Nagpur

IV

ABSTRACTS OF ORAL PRESENTATIONS

SYMPOSIUM- I:

Environmental Conflict, Rights of Nature and Human Life

R01: Treatment of leachate generated from MSW dumpsite using simultaneous aerobic and anaerobic degradation condition

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Leachate generation is an unavoidable problem today, and numerous treatment processes are available for its disposal. In this study, the characterization of leachate generated from the Bhandewadi dumpsite has been carried out. Leachate biodegradability was analyzed by biochemical methane potential test at five different inoculum ratios with anaerobic sludge at 5%, 10%, 15%, 20%, and 25%. Leachate composition and characteristics varied considerably during the experimental period (COD concentration 7833 mg/l). In BMP, 20% and 25% inoculum ratios showed the maximum COD removal efficiency of 82-85%, respectively. Following, two sets of experiments were conducted in aerobic and anaerobic conditions. Three different inoculum concentrations were kept for the study at25%, 50%, and 100% (raw leachate).The study compared the performance of aerobic and anaerobic digestions of raw leachate under different operating strategies for the simultaneous removal of COD, nitrate, and ammonia, along with methane generation was observed. Under both aerobic and anaerobic conditions, the 25% inoculum ratio showed better removal efficiency. The COD removal efficiency of 75% was observed within 14 days of treatment, whereas, in the anaerobic condition, it was around 77% in 18 days. The cumulative biogas production experimental data (20% and 25% BMP as well as batch 25%) were fitted using three mathematical kinetic models: the first-order kinetic model, the modified Gompertz model, and the logistic function model. for each inoculum ratio, all three kinetic models were found to be fitting the experimental data. The study demonstrates the stability and biodegradability of raw leachate under aerobic and anaerobic conditions, concluding that, at a 25% inoculum ratio, the degradation efficiency was highest.

Keywords: Landfill leachate, aerobic digestion, anaerobic digestion, biochemical methane potential, kinetic model study

R02: PESTICIDE RESIDUES OF PROFENOFOS IN PIGEONPEA AND ITS ANALYSIS WITH GC-MS/MS

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Profenofos, a broad-spectrum insecticide belonging to organophosphate group is widely used in Vidarbha to control insect pests of pigeonpea. However injudicious and non-observance of prescribed waiting period leads to residues in/on pigeonpea. Since green pod covers are regularly used as fodder for animals ,it can affect their health. To ensure low level of residues on green pods the present study was conducted on the samples of green pod covers from the field trials conducted for studying the bioefficacy of profenofos 50 EC against pod borer on pigeonpea. Four treatments including control with three replications were taken up using Randomized Block Design (RBD). QuEChERS method was used for extraction while identification and quantification was performed using GC-MS/MS. Residues on green pod covers in the samples of crop sprayed with 0.1, 0.125 and 0.15 per cent profenofos were 0.203,0.325 and 0.45 mg/kg respectively, which were less than maximum residue limit (MRL) of 2 mg/kg.

Keywords: profenofos, GC-MS/MS, fodder, green pod cover, QuEChERS, residues

R03: Interweaving of Right to Life, Environment and Human Rights: A Judicial Approach

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The advent of technology and development has brought along with it legal complexities. In this new era, it is very important to protect the environment against the malafide practices that are followed by individuals who are dominant in their surroundings. The importance of the environment to the fulfilment of human rights is widely accepted in International Law. The law of environment protection seeks to hold an individual right to enjoy fundamental human rights by virtue of the lack of proper legislation pertaining to the Environment. Recently, in many cases, the Hon'ble Supreme Court of India upheld that right to live in a pollution-free environment is not only protected under art 21 of the Constitution of India but also protected under the International Human Rights Law across the globe. In this paper, the authors have tried to analyse the problems pertaining to the environmental protection that are faced by individuals as protection of the environment is an integral part of the protection of Human rights. There are some of the emerging challenges, which would need to strike a balance between the Development and Environment. It recognizes some of the emerging challenges, which would need to be overwhelmed before such a right, could be recognised, which includes and draw on the disciplines of deep environmentalism and earth jurisprudence.

Keywords: Right to Life, Environment, Human Rights, NGT and Justice.

R04: Synthesis and Characterization of Znonanomaterial Based Thin Films For Detection of Microbial Components In Ambient Environment

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Microbial components are one of the major concerns in air, water, soil and food as they produce hazardous effects on human health leading to various diseases. In the present time of COVID-19 pandemic where it has been proven that these are transmitted through air which has resulted into many deaths and millions of confirmed cases. It has become more important as how efficiently and quickly we can detect these pathogens so that necessary action can be taken in time. For that we are synthesising and characterising the material which willbeused as a tool for making prototype for microbial biosensor which will be of low cost, efficient, highly sensitive and versatile. Nano materials have a great impact when used in biosensing applications because of the irunique properties at nanoscale. Metal oxide based thin films of ZnO/La_2O_3may have great potential. ZnO based thin film has been prepared and characterized to see the biosensing properties to fabricate the biosensors for monitoring and measurements of bioaerosols in the environment. ZnO thin films has been prepared using sol-gel method and characterization of thin films were done by various techniques using FE SEM,UV-VIS and XRD. ZnO electrode has been also prepared to see the biosensing application.

Keywords: Bioaerosols, ambient environment, nanomaterial, biosensors

R05:Spatial characterization of the land use land cover resources of Kashmir valley under changing climatic scenario: A case study from district Srinagar

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Large scale assessment of spatiotemporal changes in the land use land cover resources has become possible with the advent of remote sensing. In the current study the land use land cover resources of district Srinagar were characterized by using high resolution data from IRS P6, Linear Imaging Self Scanning (LISS-IV) of 2013 and 2018. The study revealed that the district is dominated by forests which cover an area of 9810.6 (21.7%) followed by scrubs 5950.2 ha (13.2%) and built-up cover 5870.7 ha (13.0%). Other classes like plantation and agriculture showed a spatial extent of 4886.7 ha (10.8%) and 4291.9 ha (9.5%) respectively. Temporally scrub, horticulture, plantation and built-up have showed 7.2%, 3.8%, 3.2% and 2.6% increase in area from 2013 to 2018. However, the total area under barren has decreased by 1.4% during the study period. Further, the study region is devoid of any glacier, however, the area under scrubs and barren at higher elevation were covered by perennial snow during 2013 which has resulted a decrease of 7.0% in the area during 2018. In the last 40 years (1981-2021) the average temperature in Kashmir valley has remained 13.14oC. Overall the average temperature from 1981-2001 has been observed as 13oC and from 2000-2021 as 13.28oC showing an increase of 0.28oC (2.15%) in the last 20 years. The data also shows that maximum spring temperature has shown an increase followed by autumn, summer and winter temperatures.

Keywords: Land use, land cover, LISS-IV, remote sensing, temporal, climate change

R06: Potential of Green Hydrogen and Its Generation by Atmosperic Moisture

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Understanding the contribution of green hydrogen and its potential future low carbon society. Making availability of Hydrogen at the domestic and commercial level, by making its extraction easier by converting renewable energy into hydrogen fuel using atmospheric Electrolysis or Biomass method. Enriching the hydrogen society for by adopting the various efficient and most economical ways of generation of hydrogen. One of the best way is to put back all Hydrocarbons and petroleum fuels with green hydrogen as industrial fuel. Hydrogen plays a key role in many industrial applications and is currently seen as one of the most promising energy vectors. Many efforts are being made to produce hydrogen with zero CO2 footprints via water electrolysis powered by renewable energies. The conventional coal gasification and steam methane reforming (SMR) process for hydrogen production are undesirable due to huge emissions of CO2. Thus, cleaner technology based on Thermal decomposition of Biomass or Electrolysis of water, are the need of today's Hydrogen Revolution. Also then making the proper storage and utilization of hydrogen by best suitable methods to get optimum results is essential to complete the hydrogen cycle. One of this way is by using the solar energy to extract the water molecules from the atmospheric moisture and powering it for electrolysis to extract the green hydrogen from moisture collected with maximum solar to hydrogen (STH) efficiency, just like plants do in nature through photosynthesis

Keywords: Atmospheric moisture, Biomass, Electrolysis, Hydrogen, Low carbon society, STH efficiency, SMR (Steam methane reforming)

R07:Tephrosia falciformis Ramaswami A Threatened Plants of Rajasthn, India

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Rajasthan is one of the most diversified state in India covering two biogeographic zones i.e. Arid and Semi-arid zones with an area of 3,42,239 km^2. The Thar Desert lies in the North Western part of the State and spreads over an area of 2,08,591 km^2. The State has a total forest cover of ca. 4.62%, in which 9% falls under Semi-arid region and the scrub forest cover is around 4,564 km^2. Rajasthan harbors around 2400 flowering plant species whereas around 670 flowerings plants occur in Thar desert area. In this habitat around 16 different endemic plants have been recorded. Tephrosia falciform is Ramaswami is also one of the threatened plant of Indian desert. T. falciformis commonly known as 'Rati-Biyani' is 3-4 feet high under shrub. It is a rare and threatened plant species of Rajasthan and distributed in Ajmer, Churu, Jaisalmer, Jodhpur and Pali, especially in the Indian Thar desert. Shrub with angled, white silky branches. Leaves imparipinnate with 7-9 pairs of leaflets, Leaflets oblanceolate or oblong, mucronate or emarginate, appressed hairy. The urbanization, over-grazing, forest land encroachments, over exploitation of timber and fire-wood, excessive collection of non timber forest products like MAP are the main anthropogenic pressures that have led to loss of biodiversity. Recent studies reveal that T. falciformis species is degraded very fast due to habitat loss. Hence, there is an urgent need to document the population status and distribution of rare endemic species in Rajasthan. Recent enhancement in human activity in this region has led to degradation and fragmentation of its habitat. Thus there is urgent need to formulate a long term conservation strategy for this threatened and rare plant of Rajasthan.

Keywords: Endemic & Threatened plants, Arid & Semi-arid region, Rajasthan

R08: Current status of aquatic biodiversity in Hirakud Reservoir

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Hirakud by virtue is human-made impoundment constructed for the purpose of irrigation, power generation, flood control and industrial needs. The vast sheet of water body (74000 ha) after construction constitute 97% of surface water resource in Sambalpur District and 28% in State of Odisha. The dam is impounded on the River Mahanadi, which from its origin to the confluence with Bay of Bengal provides an admixture of riparian, floodplain, manmade lake (reservoir), and estuarine ecosystem complexes (including physical and chemical character) supporting diverse set of both flora and fauna. The inception of impoundment had resulted in the sudden transformation to these wide ranges of ecosystem and its integral component of biodiversity. The current status of flora and fauna operating the two vital food chain indicate that the reservoir supports 39 species of phytoplankton, 36 species of periphyton 34 species of macrophytes species while 45 species of zooplankton, 35 species of mollusc, 25 species of insects, 40 species of fish, 10 species of amphibians, 7 species of reptile and 89 species of waterbird. This paper attempts to collate the available secondary information and survey data on the current status of biodiversity in Hirakud Reservoir collected during the year 2015.

Keywords: Biodiversity, Hirakud, Reservoir

R09:Studies as Heave-Metals and Physio-Chemical Qualities in river Arpa at Bilaspur city and adjoining areas.

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Water is basic need to existence of various kinds of life. The civilization and settlements were established at the banks of different river water systems. Like other major rivers such as Ganga, Yamuna, Brahmaputra, Krishna etc. Arpa river has a great significant for all point of view in Chhattisgarh. In bank of this river major city Bilaspur, Industrial zones, Dams, are located. We have taken systematic analysis of the river Arpa at the place of Bilaspur and its adjoining areas. In this context, we have choosed ten sampling location as per their environmentally significant point of view. The water qualities parameters such as temperature, pH, EC, TS, TDS, TSS, turbidity, TH, TA, DO, BOD, COD, Chloride, Nitrate, sulphate, fluoride, phosphate, Na, K, HCO_3^{-1}, CO_3^{-2}, and some selected heavy metals like As, Cr, Hg, Cd, and Fe were analysed in the month of July and August-2022 by the prescribed standard methods. The obtained experimental results were compared with the standard value of these parameters prescribed by the BIS (2012) and WHO (2011) water quality standard. The obtained results for the turbidity (>5NTU), total alkalinity (>250mgL^{-1}), Nitrate (100.647mgL^{-1}) Total hardness (254.89mgL^{-1}) were observed. From the experimental value of all these parameters have indicated, The water source of Arpa river is highly polluted at the point of river, whereas discharging the domestic sewage and agricultural runoff, The author has suggested with opinion prior the application of Arpa river purification is compulsory.

R10: Methane mitigation through linseed oil supplementation in buffalo and on farm methane measurement by sulphur hexa fluoride technique

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The linseed oil was used in the concentrate mixture to reduce methane emission in buffalo, which is feasible strategy at farm level and can be easily adopted by the farmer. The on farm methane measurement through SF6 tracer technique was standardized and seems to be most practical and reliable method for on farm methane measurement and shall be helpful in development of accurate database. The supplementation of linseed oil in buffalo could reduce methane emission significantly in-vitro as well as in-vivo.

Keywords: Methane, SF6, Linseed oil

R11:Seasonal Diversity of Brachyuran crabs in Ayiramthengu Mangrove; A Part of Kayamkulam Backwater, Kerala, India

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Mangroves in the estuarine ecosystem play important roles in biodiversity maintenance, energy flow and provides a home and feeding ground for a wide range of species. Brachyuran crabs are ecologically important and considered as inevitable part mangrove ecosystem. Here we investigates the present status of brachyuran crab diversity and seasonal variation in their distribution and abundance in the Ayiramthengu mangrove; a part Kayamkulam backwater during February 2017- January 2018. In total 1364 individuals were encountered, comprising 13 species of brachyuran crabs belonging to 4 family and 8 genera. 5 species of Portunid crab belonging to 4 genera, 5 species of Grapsid crab, 1 species of Sesarmid crab and 2 species of Ocypodi crabs were identified up to species level. The species diversity was high during monsoon (43%) followed by post monsoon (35%) and pre monsoon (22%). Salinity may be the reason for the difference in the diversity of crabs in various seasons. The calculated values of various diversity indices included Shannon–Wiener diversity (H') ranged from 1.922 to 2.355, Margalef's species richness (d) ranged from 1.048 to 1.886, Dominance Index (D) ranged from 0.1038 to 0.1497. Conservation strategies are required for the protection of Ayiramthengu region in general.

Keywords: Biodiversity, Crabs, Seasons, Kayamkulam Backwater, Diversity indices

R12: Evaluation of water quality characteristics for drinking use and its associated non-carcinogenic human health risks in Ib Valley coalfield, India

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An attempt has been made to assess the drinking water quality of the groundwater and mine water samples collected from Ib Valley coalfield, Odisha. The assessment based on the cumulative characteristics in the form of WQI reveals that around 79% of the total studied samples are in excellent to good water quality classes set for drinking use. The WQI ranged from 8.6 – 1573 with an average value of 188. Overall, the dissolved metals and ions such as Mn, Ni, Fe and F^- are collectively contributing with an average value of 89% to deteriorate the water quality for drinking. The non-carcinogenic health risk regarding the intake of water depicts that child population is comparatively on higher risk than adult male and adult female populations, and the metals such as Co and Mn are controlling the hazard index (HI)with an average contribution of 96% of the concerned water. Around 32, 39 and 46% of total samples are showing HI greater than 1 implying health risks in female, male and child population respectively.

Keywords: Coal mine water; groundwater; water quality index; non-cancer risk

R13: Assessment Of Ground, Pond, River And Canal Water Quality In Some Muncipal, Residential, Industrial & Port Areas

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The characteristics of water, air and soil having physical, chemical and biological are undesired changes. So in the Globe; people are under tremendous threat. Water is highly polluted with different harmful contaminants due to manmade activity. Leaching of soils, industrial processing, residential- municipal waste etc. and weathering of rocks; natural water contaminates. Varied of water borne diseases is suffered by human being due to use of contaminated drinking water. So it is necessary that at regular time interval quality of drinking water should be checked. Different physicochemical parameters are used with the calculation of WQI for testing of water quality.

Keywords: Water, Physicochemical Parameters, WQI

R14: Comparative Study for Leaves of Elaeocarpus ganitrus using various drying techniques On Phytochemical Profile and in vitro antioxidants

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Drying is the most important step for formulation of any herbal products. Dried herbs have many applications in the field of medicines, spices, skin care products, toiletry products and also perfume manufacturing. Drying to creates self-stability of any herbal product. Preserves the quality of herbs in process of drying by reducing the water content, which inhibits the growth of microorganisms. Antimicrobial activity of any plant totally depends onphyto constituents of this plant. Elaeocarpus ganitrus is evergreen tree and found in Himalayan region in India which belongs to Elaeocarpaceae family. Leaves, roots fruits, flowers and bark of this plant have many medicinal properties and used in traditional medication for the treatment of different ailment. We focus on young leaves of this plant. The aim of this study to determine the effects of various drying techniques (Sun drying, Shade drying, Oven drying and Microwave drying) on phytochemical constituents of Elaeocarpus ganitrus (leaves). Determine the phytochemical constituents using standard protocol of biotechnology. This study revealed the presence of alkaloids, flavonoids, tannins, saponins, terpenoids, phenolic compounds, carbohydrates, proteins and amino acids. The result shows of this study that various drying techniques play significant role for preservation them quality, antioxidants and phyto constituents of E.ganitrus leaves.

Keywords: E. ganitrus, phytochemical constituents, drying techniques and antioxidants.

R15: Assessment of surface water quality through physicochemical parameters along the river Gomti in Lucknow, Uttar Pradesh, India

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The present investigation was carried out in the capital city of Uttar Pradesh, Lucknow on Gomti River over the stretch of 19 km. The five sites were selected for the examination of water quality parameters like pH, temperature, EC, TDS, DO, BOD, total hardness, total chloride, total alkalinity, total acidity, and total free carbon dioxide. The site 1 Ghaila Pulla was considered as a reference site and four sites Mehndi Ghat, Shaheed Smarak, Kukrail Junction and Bande Dam. We found the parameters ranges varying as the river flow passes the city like temperature (31.53±0.057-37.33±0.702), pH (7.40±0.0152-8.56±0.145), EC (408.00±0-851.33±2.309), TDS (204.00±0-340.66±12.701), DO (1.33±0.100-25±1.404) BOD (1.04±0.288-13.22±1.006), total alkalinity (ND±0-9±0.152), total acidity (32.73±0.4-161.66±0.586), total hardness (25±0.07664.06±0.534), total chloride (8.32±0.0152-9.99±0.152), total free CO2 (ND±0-1.83±0.127) most of the parameters are above the BIS limit. The most polluted site was Bande Dam which carries whole effluent resembles in the Gomti river exits from the city and the most unpolluted site was Ghaila Pull due to very less domestic and industrial activities which makes the river clean and helps in flourish well of the biodiversity but day by day the increment in population and development it may be at risk of pollution which may leads to the treacherous effects.

Keywords: Population, Physicochemical parameter, Effluent waste

R16: Biodiversity of Aquatic Insects of Coleoptera in Himachal Pradesh

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Biodiversity has its own importance to provides an important natural functioning for the ecosystem. About 18,000 species of aquatic insects'coleopterans inhabit on earth and only 12,600 are described yet. Aquatic coleopterans inhabit wide range of aquatic bodies like ponds, streams, rivers, reservoirs etc. Insects belongs to the coleoptera are very large to small insects with distinct head that have chewing mouthparts. Their antennae are highly variable and compound eyes are present or absent. Various beetles like Coccinellids, ground beetles and rove beetles act as predatory insects. Besides these attributes, some of them are useful in forensic entomology and as bioindicators of environmental pollution The aquatic coleopterans play an important role in decomposition, nutrient cycling and primary productivity of the freshwater ecosystem. Members of the family Scirtidae, Hydrophilidae and Elmidae act as scavengers whereas the members of family Gyrinidae and Dytiscidae act as predators in aquatic ecosystem. Among aquatic beetles Dytiscidae is the most diverse family in the world. The part of life cycle of aquatic coleopterans is variously associated with water. The aquatic beetles are very sensitive to physiochemical changes in water and can act as good indicator of water quality, eutrophication and trophic structure of freshwater ecosystems. Despite the vast freshwater bodies in Himachal Pradesh, the knowledge of diversity and distribution of aquatic beetles is very scarce. This investigation focuses on the biodiversity of aquatic beetles in Himachal Pradesh of freshwater and their importance.

R17: Sustainable approaches for mangrove forest conservation

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Mangroves forest serves as interface between land and sea. These are most productive, good bioindicators of environmental quality and health of any coastal ecosystem, long term carbon sink. They are also well known for the sink of pollutants accumulation and bio magnification of heavy metals and also help to reduce vulnerability to climate related coastal hazards. Degradation of mangroves forest ecosystem is a serious threat to biodiversity and lives of surrounding communities. Mangrove ecosystems are threatened by climate change. The state of knowledge of mangrove vulnerability, responses to predicted climate change and adaptation options are very much required for mangrove forest conservation and mangrove ecosystem sustainability. Based on available evidence, climate change outcomes, relative sea-level rise is the greatest threat to mangroves. Most mangrove sediment surface elevations are not keeping pace with sea-level rise, although longer term studies from a larger number of regions are needed. Adaptation measures can offset anticipated mangrove losses and improve resistance and resilience to climate change. Coastal planning can adapt to facilitate mangrove migration with sea-level rise. Management of activities within the catchment that affect long-term trends in the mangrove sediment elevation, better management of rehabilitation of degraded mangrove areas, and increases in systems of strategically designed protected area networks will be helpful for conservation and management of mangrove forest. There is a need to develop promising strategies for the degradation of environmental pollutant and conservation of mangrove ecosystem through community participation. Community based approach for restoration and sustainable management is the dynamic option for the improvement of livelihood and reduction of the vulnerability of ecosystem. This approach will promote the sustainable use of mangrove in order to strengthen the resilience of humans and the natural environment as well as to mitigate the impacts of climate change. This paper will highlight on mangrove status, various aspect related to threats and conservation strategies.

Keywords: Mangrove Forest, climate change, adaptation & mitigation, community participation

R18: Degradation Of Largest Estuarine Mangrove And Offshore Ecosystem By Trawl Netting

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Estuarine & marine ecosystem developed in the unique bio-climatic littoral and infra-littoral zone of West Bengal accommodates the worlds' largest mangrove food web named 'Sundarbans' declared as World Heritage Site in 1989. Huge reserve of microscopic phyto-planktons forms the extensively broad baseline of marine food chain and mangrove food web as well, followed by other marine species occupying different higher trophic levels. Growing population has forced intensification of commercial trawl netting all along the offshore through decades where modern bull trawlers, as non-selective fishing gear, continuously drag bigger trawl nets through ocean bottom for huge commercial catch, scoops out sea-floor biodiversity and at random destroy under-sea habitat of innumerable ecologically valuable baseline species of the largest mangrove food web. Loss of these baseline components by any anthropogenic intervention, will assure evitable collapse of entire marine food pyramid in long run as a great threat to all top consumers including the humans (Das.M, 2002). Considering high ecological sensitivity of the Sundarbans bottom trawling has been studied in Tajpur-Shankarpur-Digha-Petua fishing zone that initially proved biodiversity richness inversely related to the offshore distance and consequently loss of marine biodiversity, in general, decreased with increasing depth and starting distance of trawling. So, higher trawling mortality causing higher loss of benthic biodiversity is recorded at shallower continental shelf, closer the coast, because of maximum benthic nutrient deposition and vice versa. So, this study as a whole proves that trawling mortality is basically a response to or a great impact of Starting distance of trawling, Total trawling mileage and Depth of trawling performed by individual commercial trawler. An abrupt hype in sea water Ph also proves maximum trawling mortality boosted up sea water Ph near the coast up to a certain offshore distance and lower Ph with lesser mortality at higher distance off Bengal coast. Trawl induced heavy metal specially lead and copper pollution is also proved getting higher with increasing distance from the coast because of huge gathering of trawlers and long period stay into deep sea fishing fields, constant washing and cleaning with hard detergents, oil filling and frequent oil-spills etc. taken

place during each trawling operations of $1^{1/2}$ to 2 weeks throughout the winters. Riverside spots devoted to prolonged trawl resting, washing with hard detergents, repairing, greasing and painting of the trawlers during three pick summer months of trawl maintenance eject petrochemical wastes causing higher copper and lead pollution in the estuarine soil even more than the offshore fishing routes. As waste chemicals in estuarine water normally move out of place with regular off-tidal and on-tidal flows, it does not carry any imprint of trawl degradation. So, this is well proved that trawling at higher depth far from the coast causes lesser loss of biodiversity than that in the shallower water. Unfortunately, commercial trawlers, quite naturally, practice fishing in the biodiversity-enriched shallower water to ensure highest catch with maximum profit at the cost of total destruction of entire base level benthic as well as higher order species. This ecological loss is proved to be triggered by trawl induced water and soil pollution with continuous mangrove destruction throughout the fishing estuaries and coastline. Increasing trawling mortality with bio-chemical degradation is proved solely responsible for great food crisis for apex species like shark, dolphin and seal, recent non-availability of prawn seedlings, sea conches and many local fish varieties and total extinction of Chandana Hilsa widely available thirty years ago in Bengal offshore. Eventually entire fish-loving Bengal population is facing great scarcity of all commercial varieties of edible fish and local poor coastal fisherfolk is also facing severe food shortage and professional crisis since the last couple of years. This uncontrolled malpractice will very soon put the existence of coastal humans in danger. Hence, an effective Environmental Management Plan for trawl fishing is also chalked out including compulsory preventive measures i.e, total ban of trawl netting, night trawl, monsoon trawl and mandatory use of trammel net as a floating gear with some curative measures i.e, instant 'on boat' release of all non-target by-catch species alive into the sea, strict inspection on rules violation and registration cancellation of all fishing vessels without trammel nets. West Bengal offshore area needs immediate introduction of this effective plan of marine environmental conservative measures to make a balance between ecology and economy as well.

R19: Adhesive Preparation from Waste Thermocol by Using Organic Solvents With its Strength

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Thermocol is one type of polystyrene, polymeric material and it is used for packing if many items now a days. Most if this used polymeric material is thrown away as waste which causes water and land pollution. As it is bulky and fluffy material with less mass and higher volume the recycling and reusing by its transportation is found difficult economically. Very less possibilities are found for reuse or recycling of such thermocol material. In this study we have experimentally identified the recycling and reusing of such material. We had carried out systemic practical work and converted the used thermocol into adhesive material with different mixtures of some selected solvents. We have also studied the initial, interim and final strength of the prepared adhesive material with its stickiness and stretching capacity. We found some solvents with good to moderate and some very good results. The study can be useful for commercial preparation of adhesive from waste thermocol.

Keywords: Thermocol, Pollution, Adhesive, Recycle, Reuse of thermocol

R20: Adaptive Evolution In Sphingopyxis Sp. Mc4 For Enhanced Bio Degradation Of Hexachlorocyclohexane (Hch)

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Hexachlorocyclohexane (HCH) is a chlorinated pesticide that widely used as an insecticide and in health programs. γ-HCH is only the effective component that exhibit the insecticidal property. The remaining part consists of α-, β-, and δ-HCH collectively known as HCH muck, discarded and led to the large deposits of wastes all over the world. β-HCH is the most persistent and recalcitrant to degradation and survey of several contaminated sites showed predominance of βHCH. Only fewer bacterial strains known to degrade β-HCH. In our study we have isolated as strain Sphingopyxis sp. MC4 from HCH contaminated soil. We explored the unique abilities and genetic adaptations of strain MC4 to tolerate and degrade the most recalcitrant β-HCH isomer, as compared to other isomers by employing biochemical and molecular methods along with the genome analysis. Strain MC4 can efficiently tolerate and degrade the HCH isomers, especially the most recalcitrant β-HCH, demonstrated by gas chromatography, mass spectrometry and NMR analysis. Complete genome analysis revealed the organization and position of the lin genes in close proximity in the genome as compared to other strains. Variations in the lin genes, their organization and acquisition in strain MC4 together with the gene expression pattern highlighted the differences from the other known degrading strains. Evolutionary analysis pointing towards the selection of lin genes of strain MC4. Phylogenetic relationship revealed that strain MC4 is a new subspecies and also the first strain of genus Sphingopyxis, reported for degrading all four HCH isomers. These findings can facilitate advancements in the field of HCH biodegradation by providing a suitable microbial candidate that can be applied to the contaminated fields for bioremediation.

Keywords: Hexachlorocyclohexane, Sphingopyxis, HCH-Degradation, Bioremediation

R21: Proton Exchange Membranes (PEM) for Microbial Fuel Cell (MFC): An Overview

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At present, whole world is looking towards alternative sources of energy. Microbial Fuel Cell (MFC) is a bio – electrochemical system (BES) which produces green electricity from organic waste by using different kinds of microbes. All variety of recyclable reserve substrates are oxidised by different microbes. Among all components, membrane is the key component of MFC which contributes approx 40% of the overall cost of the system. A proton exchange membrane (PEM) is primarily involved with the transport of protons (H^+ ions) from the anode to cathode, acting as a separating barrier between the contents of the anode and the cathode compartments. It also prevents the flow of electrons from anode side to cathode side. Presently perfluorosulfonic acid (PFSA) containing material like Nafion is used primarily as membrane material for MFC. But this membrane having various drawbacks like high cost, low operating temperature restriction, mechanical stability etc. Due to these reasons, many researchers are trying to develop alternative PEM based on polymeric materials like polystyrene, poly ether ether ketone (PEEK), polybenzimidazole(PBI) etc. These materials having low material cost as well as fabrication cost and significant performance efficiencies in comparison to present Nafion membrane. Recent development in the field of alternative PEM for MFC will be discussed in this paper.

Keywords: Proton Exchange Membrane (PEM), Microbial Fuel Cell (MFC), Bio – Electrochemical System (BES), Perfluorosulfonic Acid (PFSA), Polybenzimidazole (PBI)

R22: Metagenomic Analysis of Rabindra Sarobar Lake depicting the improvement of its water quality

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Rabindra Sarobar Lake is situated at the heart of Kolkata at $22^0$30'.30"-$22^0$30'42"N longitude and $88^0$21'-$88^0$22'E latitude. It is a man-made freshwater lentic ecosystem that was established in 1935 by Nichidatshu Fujii. This lake is the abode of variety of fishes among other aquatic life and water activities like rowing and swimming are also very common. In general the ecosystem provides a stable oxygen concentration which supports these fishes and other aquatic flora and fauna. This lentic ecosystem shows a unique microbial variation showing a cyclic appearance of green algae and blue-green algae, the former increasing the oxygen concentration supported by the bacteria during summer. This is mainly through nutrient leaching. The pre-dominance of these green algae brings about a reduction of blue green algae population decreasing the algal bloom in water. In this investigation a thorough metagenomic analysis is carried out indicating a minimum cyanobacterial and maximum bacterial population. Thus in this condition aquatic fauna is safe. In vitro experiments with culturable bacteria named as BUK, BST1, BP1, BTH and BAC3 also promotes the growth of green algae in the presence of minimum nutrients supply. These cultured bacteria mainly belong to the genus bacillus, which is also revealed in metagenomic analysis.

Keywords: Metagenomic analysis, algal bloom, Rabindra Sarobar Lake, green algae dominance.

B23: Groundwater Quality Forecasting In The Vicinity Of Byramangala Tank Using Visual Modflow

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Study was conducted to assess the influence of pollution of Byramangala tank on the groundwater quality in the vicinity the tank. Visual MODFLOW was used. The study area is limited to 136 km2. The Hydraulic head and TDS concentrations required for the study was collected from KSPCB, and District Ground Water office. Four observation wells located at Chikkakuntanahalli, Chowkahalli, Kodihalli, and Abhanakuppe were selected. The MODFLOW and MT3DMS models are calibrated and validated by using the data of the years from 2014 to 2019. The validated model has been used to predict the TDS concentration at the end of year 2029 for three different scenarios (i) without any control measures for the next 10 years, (ii) Control measures to reduce the pollution load with TDS levels of 500 mg/l for the next 10 years (iii) zero discharge is practiced for next 10 years. It was found that implementation of control measures could protect the groundwater from further 3 deterioration. The simulation results show that significant improvement in the quality of groundwater was observed for the implementation of various control measures.

Keywords: Groundwater, Byramangala tank, VISUAL MODFLOW, MODPATH, MT3DMS, TDS concentration.

R24:Sustainable approaches for mangrove forest conservation

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Mangroves forest serves as interface between land and sea. These are most productive, good bioindicators of environmental quality and health of any coastal ecosystem, long term carbon sink. They are also well known for the sink of pollutants accumulation and bio magnification of heavy metals and also help to reduce vulnerability to climate related coastal hazards. Degradation of mangroves forest ecosystem is a serious threat to biodiversity and lives of surrounding communities. Mangrove ecosystems are threatened by climate change. The state of knowledge of mangrove vulnerability, responses to predicted climate change and adaptation options are very much required for mangrove forest conservation and mangrove ecosystem sustainability. Based on available evidence, climate change outcomes, relative sea-level rise is the greatest threat to mangroves. Most mangrove sediment surface elevations are not keeping pace with sea-level rise, although longer term studies from a larger number of regions are needed. Adaptation measures can offset anticipated mangrove losses and improve resistance and resilience to climate change. Coastal planning can adapt to facilitate mangrove migration with sea-level rise. Management of activities within the catchment that affect long-term trends in the mangrove sediment elevation, better management of rehabilitation of degraded mangrove areas, and increases in systems of strategically designed protected area networks will be helpful for conservation and management of mangrove forest. There is a need to develop promising strategies for the degradation of environmental pollutant and conservation of mangrove ecosystem through community participation. Community based approach for restoration and sustainable management is the dynamic option for the improvement of livelihood and reduction of the vulnerability of ecosystem. This approach will promote the sustainable use of mangrove in order to strengthen the resilience of humans and the natural environment as well as to mitigate the impacts of climate change. This paper will highlight on mangrove status, various aspect related to threats and conservation strategies.

Key words: Mangrove Forest, climate change, adaptation & mitigation, community participation

R25: Waste Water Treatment: Current Scenario in India

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Water, food and energy securities are emerging as increasingly important and vital issues for India and the world. Due to the simultaneous effects of agricultural growth, industrialization and urbanization current and future fresh water demand could be met by enhancing water use efficiency and demand management. Thus, wastewater/low quality water is emerging as potential source for demand management after essential treatment. Waste water is generated after the use of freshwater, raw water, drinking water or saline water in variety of deliberate applications or processes. Wastewater is used water from any combination of domestic, industrial, commercial or agricultural activities, surface runoff/ storm water and any sewer inflow or sewer infiltration. Generally wastewater is use for domestic or sewerage water. The water effluent from the treatment plants, often, not suitable for household purpose and reuse of the waste water is mostly restricted to agricultural and industrial purposes. However, there are higher risk associated to human health and the environment on use of wastewater especially in developing countries, where rarely the wastewater is treated and large volumes of untreated wastewater are being used in agriculture.

Today, increasing population, urbanization and modernity have encouraged the use of water, day by day the amount of unusable water coming out from homes, factories etc is increasing. In view of the paucity of potable useful water, it has become necessary to convert the waste water into useful water. This will not only reduce the scarcity of water, but also the damage caused to the environment by dirty, smells and chemical - laden water can be avoided.

In this research paper, we will throw light on the types of waste water, their treatment methods, treatment plants in India, treatment projects, benefits of treatments etc.

Keywords: Wastewater, Domestic Water , Industrial Water, Agricultural Water , Urbanization, Sewerage Water. Wastewater treatment.

R26: Study of Water Quality Index (WQI) of Different Physicochemical Parameters of Taladanda Canal Water in Cuttack and Paradeep City, Odisha, India.

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The physico-chemical study of Taladanda canal water samples were collected in the area of Cuttack and Paradeep city; from upstream (CW1), midstream (CW2) and downstream (CW3). It has been carried out for the suitability and drinking purposes of the surface water. During 202122 in four different seasons' the surface water was monitored. Percolation of domestic sewage and anthropogenic activities into the water of study area has been proved by the analysis. Downstream parameters levels of canal water were significantly elevated than the upstream. Major source of water in Paradeep area is canal water. It needs constant monitoring to maintain quality.

Keywords: Canal water, World Health Organization drinking water quality standards, Physicochemical parameters and WQI

R27: Solar PV Plant Re-Powering: Mission Transform-Nation

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India is blessed with abundant soar energy (over 5000 trillion KWh/Year) which is many times more than the total energy consumption of the country, and if harnessed efficiently, the country is capable of producing trillion-Kilowatts of electricity. Solar energy is extremely beneficial as it is non-polluting and its generation can be decentralized. There is need to come together and take initiatives to create technologies for a greater use of these sources to combat climate change by reducing the emission of greenhouse gases. There are two basic type of solar PV plant repowering. The First is for existing plant and second is for extending the life of new plants at the end of their initial design life which is projected at about 20 to 25 years. In this study the solar PV plant design aspects along with its annual performance is elaborated. The various type of power losses (temperature, internal network, power electronics, grid connected etc.) and performance ratio are also calculated. The performance result of the plant are also compared with the simulation values obtained from PV-syst and SAM software. Building a robust system id somewhat at odds with building a cheap least cost system. The advantages are O&M labor and project risk are reduced as potential income is increased while dramatically reducing system defects, faults and failures. In other words, they have a superior plant availability throughout their life cycle. The growing energy demand in developing nations has triggered the issue of energy security. This has made essential to utilize the untapped potential of renewable resources. Grid connected PV System have become the best alternatives in renewable energy at large scale. Performance analysis of the grid connected plant could help in designing, operating and maintenance of new grid connected systems.

Keywords: Energy Security; Photo-Voltaic (PV); Re-Powering; PV Simulation Software; SAM (System Advisory Model); Performance Ration; Grid Connected PV System

R28: Icthyo Faunal Diversity of Angoori Barrage, Datia Madhya Pradesh

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This research work generates some preliminary data information regarding ichthyofaunal diversity status of the Angoori Barrage located in Datia district of Madhya Pradesh from a period of January 2020 to December 2021. The various varieties of piscian species were collected from four different sampling locations of this water body,which includes Gandhari, Lamacha, Pisnaari and Dam head. During this study, a total 18 fish species weredocumented which are classified under the 08 orders and 12 families. The Cypriniformes (38.88%) order contributes maximum number of piscian species followed by Siluriformes (27.77%),Ophiocephali formes, Beloniformes, Osteoglossiformes, Perciformes, Anguilliformes and Cichliformes (5.55%) respectively. In thepresent study share percentage composition of piscian species of order Cypriniformes was dominant with 07species followed by Siluriformes with 05 species, while order Beloniformes, Ophiocephali formes Perciformes, Anguilliformes, Osteoglossiformes and Cichliformes were represented by single species respectively.

Keywords: Ichthyofaunal diversity, Angoori Barrage, Madhya Pradesh

R29: Green Synthesized Zinc Oxide Nanoparticles for Water Remediation

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Zinc oxide (ZnO) is a very important II-VI semiconductive material with a wurtzite structure and three polar surfaces; this material has an energy band gap of 3.37 eV at ambient temperature. Zinc oxide micro and nanostructures are gaining popularity due to their wide range of applications in medicine, cosmetics, pharmaceuticals, and the environment (treatment of contaminated air, wastewater, and plastic). The most important application is photocatalytic pollution degradation. Chemical pollutants emitted by textile factories are becoming a major source of water contamination, causing dangerous diseases all over the world. There are three kinds of ZnO-based nano photocatalysts: immobilized, doped, and composite. The uses and performance of ZnO nanostructured materials are also influenced by the preparation methods and shape. Furthermore, the use of green chemistry and green engineering in the design of nanoscale ZnO improves the environmental sustainability of nano-material products and has triggered clean manufacturing processes ZnO nanoparticles for environmental remediation, renewable energy, water treatment, hazardous chemical substitution, and waste management applications. As a result, the current study will thoroughly analyze the various synthesis procedures for innovative, compatible, simple, ZnO nano-particles and their effective usage in various environmental applications.

Keywords: Nanoparticles, Zinc oxide, Photocatalyst, Water pollution, Remediation.

R30: Ethno medicinal uses of Moringa concanensis Nimmo, a potential medicinal plant

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Moringa concanensis Nimmo(adavi munaga) is one of the important medicinal plants belonging to the family Moringaceae. The present study was aimed at recording traditional knowledgeabout this plant in various localities of veyyinuthula kona, sacred grove of Pendilimarrimandal, YSR district, Andhra Pradesh, India. There are very few reports on this indigenous plant. Therefore intensive fieldwork was done in different areas of YSR district. Local people and traditional herbal healers were interviewed and several houses were visited and collected information on the plant and their curative properties. All parts of Moringa concanensis are used for treating various human ailments. The preparation of the drug from this plant is easy and simple. The plant adavi munaga is different from the munaga (Moringaoleifera). Many types of the human ailments such as jaundice, skin tumors, blood pressure and tiredness, head ache, diabetes, spinal cord pain, menstrual problems etc., may be cured by using this plant with simple preparation and administration. Therefore Moringa conconensis is a potential source of new useful drugs and may attribute to the pharmacological properties. Further analysis of phytochemicals of this plant is necessary for drug discovery.

Keywords: Adavi munaga, traditional medicine, Moringaceae, Moringa conconensis Nimmo.

R31: Removal of Phenol from Aqueous Solution through Natural Polymeric Substances

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Phenol and its derivatives are compounds that are found in many industrial wastewaters such as in paints, paper, plastics, oil and gasoline, steel, textile and wood industries. They are one of the largest group of water pollutant owing to their presence in many industrial waste water because of their wide uses. In addition, leakage accidents that took place during the transportation and storage of phenol causes contamination of water resources. It is in the list of priority pollutants of US Environmental Protection Agency(EPA) and it has toxic, carcinogenic effects on human and aquatic organisms. Therefore waste water containing phenol should be treated before discharge to its high toxicity even at low concentration. Over the last few years, the treatment of wastewater contaminated with phenol and its compound has attracted great attention due to their toxicity and low bio-degradability properties. Several treatment processes are used to remove or recover phenol and its compound from waste water in the literature and many of them have some advantages and drawbacks.

The present study reveals the liquid phase adsorption of phenol from water and wastewater by tree barks of different species (ficusracemosa) and (Artocarpus heterophyllus). Kinetic and equilibrium experiments have been performed for the above low cost absorbents and effects of pH, time and dose are investigated. The data generated under effective optimization conditions are used to fit in the adsorption model (Freundlich Adsorption) and Adsorption Isotherms generated through which the nature and efficiency of the absorbents have been worked out.

The studies show more than 90% removal of Phenol from aqueous solution and isotherms indicate good agreement for the validity of the model.

Keywords: Adsorption, Phenol, Artocarpus Heterophyllus (Jack Fruit), Ficus Racemosa(Umber)

R32: Study of power generation in different designsplant microbial fuel cell assemblies using Capsicum frutescens

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Three designs of Plant Microbial Fuel Cell Assemblies were tested for power generation for 27 days. The observations of voltage (V), Current (I) and weight loss in PMFC systems were recorded consecutively. The highest power was recorded in P1 design with 1740 mW. Highest power in P2 and P3 sets were 210 mW and 300 mW respectively. Plants in set P1 survived for 11 days, but plants in set P2 and P3 survived for 27 days and 22 days respectively. Sustainable power generation is missing in all the three designs, hence more design improvisation is required for sustained power generation.

Keywords: Plant Microbial Fuel Cell, Rhizosphere Engineering, Bioenergy

R33: Qualitative and Quantitative Evaluation of Lentinus sajor-caju (Fr.) Fr. for Cellulose and Lignin Degrading Enzymes

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Lentinus sajor-caju (Fr.) Fr. is an agaricoid mushroom and has been classified under Phylum – Basidiomycota, Class – Agaricomycetes, Order – Polyporales and Family – Polyporaceae.

L. sajor-caju is wood decaying and live in nature on variety of woody substrates. The objective of the present work was to assess qualitatively and quantitatively cellulose degrading enzyme (cellulase), lignin degrading enzymes (lignin peroxidase and laccase) and hemicellulose degrading enzyme (xylanase). Qualitative assay of cellulase, lignin peroxidase, laccase and xylanase showed the positive indication for the secretion of enzymes by L. sajor-caju. Every four days after vegetative growth and cellulose, lignin, hemicellulose degrading enzymes produced by L. sajor-cajuwere estimated on quantitative basis. The results revealed that mycelial growth was slow during the initial days of incubation and increased after 4 days of incubation. The growth was maximum (5.88 mg/mL) on 12thday of incubation. The maximum activity of cellulase (236.40 U/mL), lignin peroxidase (30.11 U/mL), laccase (133.30 U/mL) and xylanase (91.79 U/mL) was observed at 12th day of incubation. Enzymes produced by L. sajor-caju increase with the increase in its vegetative growth and gradually decreases with decrease in the vegetative growth. From economic point of view L. sajor-caju elucidated to act as agents of timber decay.

Keywords: Cellulase, enzyme, Lentinus sajor-caju, lignin peroxidase, laccase, xylanase.

R34: Current status of a pre-historical Lake (Chandravalli): A study with reference to water quality and zooplanktons

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The study was conducted to determine current status of Chandravalli Lake through physicochemical parameters and zooplankton presence in Chitradurga district, Karnataka, India. Eighteen water quality parameters were analyzed and eighteen zooplankton species were recorded. Cladocera was dominating group in the Lake with nine species.

Bosminopsisdietersi was most abundant species in the group. Rotifera was represented with five species with Keratellatropica being the abundant species. Copepoda included three species of which Tropocyclopsprasinus leading and it was the highest abundant species of all groups. One species of ostracoda was observed. Overall count of 12,620 individuals of zooplankton were recorded.

R35: Bamboo Diversity and Utilization in Manipur

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In Manipur, bamboos play an important role for the livelihood of the local people life and dependence on bamboo by the local people is magnificent. However, this wonderful friend of mankind is becoming fast depleted from its wild habitats Amongst all the bamboos, Bambusanutans is considered the best. It is the strongest and most delicious; people commonly plant it in their homegardens. However, people are less concerned about cultivation and sustainable use of bamboos and continue its extracting at will to meet their daily requirements. Besides, the culture of planting bamboo in homesteads is being abandoned slowly in the city areas of the state due to urbanisation, population growth and construction of houses. As a result, bamboo resource is becoming depleted at a faster rate which otherwise is a natural saviour of mankind.

Keywords: Bamboo, livelihood. homagarden, Resource Depletion

R36: Evaluation of Persistent Organochlorine Pollutants in Mother's Milk from Kalaburagi District, Karnataka, India

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In present study, traces of organochlorine pollutants and related compounds namely DDE p, p' and DDE o, p' were analysed in mother's breast milk living in rural areas of Kalaburagi district, traces of organochlorine pollutants were analysed in almost 80% of the samples analysed from rural areas. Demonstrating that residents in these areas have been exposed to the contaminants. Kalaburagi is having fertile land, a variety of seasonal crops are cultivated in the selected study area, farmers practice large amounts of pesticides to increase the crop productivity and control the pests. Exposure of humans to these hazardous chemicals occurs directly in fields as women works as agricultural labour and indirectly due to intake of contaminated food habits. The organochlorine pollutants are lipophilic in nature and their presence in mother's milk has been documented in different parts of the country. Breast milk samples were collected from mothers who were willing to donate the samples after signing the informed consent form. The levels of total OCPs in milk ranged from 5 ng g-1 to 9 ng g1. The results are within permissible limits provided and harmless.

Keywords: DDE; Breastfeeding; Kalaburagi; Pesticides.

R37: Occurrence of β-lactamase producing MDR Enterobacterhormaecheiin pharma effluent: Growth and Production

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Antibiotics are medications that fight bacterial infections either by destroying or by slowing down the bacterial growth. Antibiotic resistance occurs when microbes develop mechanisms that protect them from effect of antibiotics. The resistance level is increasing to 5 to 10% every year for broad-spectrum antimicrobials which are highly misused. In the present study, a gram negative bacilliEnterobacterhormaechei was isolated from pharma effluent of Himachal Pradesh, India, with a sustaining capacity of upto 15,000ppm of ampicillin in the culture medium. The bacterial strain was resistant for ampicillin and other antibiotics of 3 different class such as trimethoprim, fusidic acid, chloramphenicol, kanamycin, erythromycin, amoxyclav indicating its MDR status. Production of β-lactamase in the isolate was confirmed by qualitative and quantitative estimation which indicated a higher enzyme activity. β-lactamase mediates resistance to these antibiotics only when it is produced in large quantities or large numbers of plasmids are present. Till date it is observed that constant evolution of substrate specificity meets each new β-lactam introduced. The emergence of Enterobacter as a worrying resistant pathogen is an important health concern, especially when the scarcity of new antibiotics active against Gram negative bacteria is considered.

Keywords: Antibiotic resistance, β-lactam antibiotic, Enterobacterhormaechei, β-lactamase

R38: Biosurfactant-assisted Bioremediation of Crude Oil/Petroleum Hydrocarbon Contaminated Soil

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Petroleum hydrocarbon contamination to soil and water resources are one of the severe threat for environment which is resulting from accidental oil spills, industrial runoff, leakage of underground tank and pipelines etc. Due to the complex heterogeneous mixture of aliphatic and aromatic hydrocarbons, petroleum hydrocarbons are carcinogenic and neurotoxic in nature. Soil toxicity by petroleum hydrocarbons decreases the fertility of soil, lower seed germination rate, decreases the plant growth and productivity of the crops. Different technologies have been introduced for the remediation of crude /petroleum oil-contaminated sites, but detoxification of petroleum contaminated sites through biosurfactant producing bacteria is one of the most prominent approaches. In the present review, we focus on the various aspects of biosurfactant and their role in the management of petroleum-contaminated soil.

Keywords: Petroleum contamination, Bioremediation, Biosurfactant, Detoxification

R39: Ethnobotanical Importance of Some Plants From Riparian Vegetation of Beas River of Himachal Pradesh

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Ethnobotany explains the relationship between particular cultures and the local plants of a region. Ethnobotanists investigate how plants, their parts, and products are used by indigenous communities to meet their daily life requirements, such as food, shelter, clothing, for primary healthcare, and for religious aspects. Ethnobotany has a wide range of significance. Developing a sustainable environment and finding novel herbal treatments for various diseases associated with modern lifestyles may benefit from research into the nutritional value of indigenous foods and local plant knowledge. Himachal Pradesh is a beautiful place which is full of rivers, mountains, and forests with characteristic floral vegetation having ethnobotanical importance. Riparian vegetation is a special type of vegetation found on the banks of rivers, which is essential for maintaining the aquaticterrestrial linkages as well as regulating the nitrogen cycle in streams, preventing soil erosion, and stabilising river banks. Riparian vegetation includes climbers, grasses, herbaceous plants, macrophytes, shrubs, sedges, and woody vegetation. Riparian forests are ethnobotanically important because plants like these are essential to meet a person's daily needs who resides in the vicinity and surrounding areas of the river. This study focuses on the ethnobotanical importance of some plants from the riparian vegetation of the Beas river in Himachal Pradesh. There are some plants from the riparian vegetation of the Beas river, such as Acoruscalamus, Acacia catechu, Achyranthesaspera, Bauhinia variegata, Dalbergiasissoo, Emblicaofficinalis, Solanumviarum, etc., which are important from an ethnobotanical point of view. The Katha obtained from Acacia catechu is used for oral and gum disorders; the floral bud of Bauhinia variegata is cooked as a vegetable which is nutritious and has anti-diabetic properties; the wood of Dalbergiasissoo is used for making furniture etc. Traditional wisdom about the utilisation of local plants for various purposes is eroding with the advancement of technology, developmental activities, and changing lifestyle, so it is the need of the hour to preserve and conserve this traditional knowledge for the benefit of future generations in the form of documents and literature.

Keywords: Ethnobotany, Riparian vegetation, Traditional wisdom, Sustainable environment etc.

R40:Eco-Friendly Approach in Organic Farming Through Microbial Supplementation

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Organic farming has become the need of the hour owing to the harmful environmental impact of the chemical fertilizers. Microbial supplementation is one of the novel techniques that can be incorporated to mitigate the ill-effects of synthetic fertilizers, alongside increasing agricultural productivity. In this paper, a bio-fertilizer made from a novel consortium of microbes was used along with organic compost to check their efficacy on okra plants. These microbes were selected from the rhizosphere of different crop plants and they are potential PGPR having Nitrogen fixing ability and can solubilise phosphorus and potassium. Moreover they did not exhibit any antagonism between themselves and thus do not have any negative impact on the soil. They were subjected to four treatments: control, compost, bio-fertilizer and a combination of compost and bio-fertilizer (1:1). Maximum growth was observed for bio-fertilizer, followed by the combination and then by compost. Thus, it can be concluded that the plants with added microbial supplementation showed significantly ($P < 0.005$) better growth trends than those without and therefore it can be further explored as a bio-fertilizer.

Keyword: Microbial supplementation, organic farming, bacterial consortium, bio-fertilizer, compost, okra,PGPR, antagonism.

R41: Study of Residential Birds in Urban Locality of Mumbai

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Availability of lustgreen canopy in Ismail Yusuf College Campus in urban locality of Mumbai city provide roosting and nesting site to the 33 species of residential birds. 20 species of Passeriformes was found to be dominant group followed by 2 species of Accipitriformes, Coraciiformes, Cuculiformes, Psittaciformeseach while single species of Apodifo rmes Columbiformes, Piciformes, Strigiformesand Pelecaniformes were recorded respectively. Though surrounded by heavily populated and dense urbanized locality, the campus is rich in terms off ood availability and is a shelter place for residential birds, but increasing encroachment is causing adverse effect on birds.

Keywords-Ismail Yusuf College, campus, residential birds, shelter place, encroachment

R42:Water Quality Analysis of Community Ponds Located at Suburban Area of Imphal, Manipur

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Water is one of the most important substances which sustain various form of life on the biosphere. It is necessary to monitor carefully from time to time physical, chemical and biological characteristics of different water resources has been deteriorating rapidly in several parts of the country including A study was conducted in Manipur state situated at the extreme north eastern corner of the country (Latitude $25^0$68'-28^0 83'N and Longitude $93^0$03'-94^0 78'E) adjoining Myanmar on the community ponds for assessing water quality .Ponds are important part of community life in Manipur as important water resources used for various domestic purposes and even for drinking. These ponds are built and managed by the community and village level institutions. However, condition of such important ponds are getting polluted day-by-day owing to ever increasing population, dumping of wastes, sewage, automobile exhaust and urban runoff etc. that put together a great pressure on the existing water resources. Indeed, many religious occasions and ritual activities are associated with ponds and take place in ponds.

Keywords: Community ponds, water quality, water resources deterioration

R43: Fireworks Causing Hazardous Environment - A Study

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Nowadays, fireworks are very common for the celebration of any auspicious occasion. It creates inconvenient noise and air pollution in the environment and this costly and harmful vitality of joy can profoundly affect the life of man. It is, therefore, every citizen needs to understand these factors for a clean environment for the betterment of humankind.

In the present study, the investigator considered the fireworks observed during the Diwali festival create air pollution in the environment. The AQI data of PM 2.5 of 11-17th, November 2020 has been taken from the website of the Central Pollution Control Board of various cities of India. It has been found that the next day of Diwali has reported a maximum value of AQI 500 a hazardous category. Chandrapur recorded the finest environment, whereas, Delhi had experienced the most polluted city in the country. The next day of Diwali has shown hazard environment in most of the cities. AQI consists of the gases NO_2, NH_3, SO_2, CO, and O_3. The multicolored crackers are the most popular, however, but, they released dangerous gases from the material of copper (blue), sodium (yellow), titanium (silver white, yellow & blue) barium (pale green), strontium (red), calcium (orange), magnesium (white), strontium-copper (violet), calcium (orange) of fireworks; which causes, the diseases like cancer, skin diseases, eyes infection, liver and lungs infection, kidney, asthma, etc.To avoid this inconvenience Supreme Court ordered to use of green fireworks. As per the Supreme Court order, on Diwali, firecrackers can explode between 8 am and 10 pm. People can burst firecrackers on Christmas and New Year from 11:55 am to 12:30 pm.

The study suggested creating awareness and cooperation among the general public and to follow the guidelines of the Supreme Court by using green firecrackers for a clean environment.

Keywords: AQI, PM 2.5, Environment, Air Pollution, Diseases

R44: Conservation Need of Medicinal plants for Healthcare and Women's Role

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Women have a profound knowledge of plants growing around them and plants products assuring nutritional and health security. However with the advent of modernization, adverse impact is observed on the traditional knowledge system eroding the natural base of human existence. About 7,500 species of plants from diverse habitats are used in local health traditions in rural and tribal villages in India. Due to increasing awareness of the usefulness and benefits of the Indigenous medicine, internal and external demands of drugs mentioned in these systems are increasingly enormously. It may be mentioned that 80% of people in developing countries are totally dependent on herbal drugs for their primary healthcare. The use of medicinal plants is growing rapidly throughout the world with the increasing demand for herbal drugs, natural health products and secondary metabolites. The accelerated loss of species and habitat destruction worldwide has increased the risk of extinction of medicinal plants. Sustainable use of wild resources must be practiced which can be an effective conservation alternative.

Keywords: Local health traditions, nutritional and health security, primary health care, medicinal plants, conservation

R45: Impact of Fluoride on Gastrointestinal Tract with respect to the Epidemiological Survey in new Bhojpur Area of Dumraon, (Buxar)

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Nearly about more than last six decade it has been noticed that ingested fluoride by human individuals as received by various sources, causes acute and chronic poisoning to the gastrointestinal tract. Damage to the gastrointestinal tract as caused by low level exposure to fluoride has been studied for a very long time (Roholm 1937). Fatalities through accident or self-harm arising from the use of Fluoride product have provided autopsy data [Shalman 1997, Lech 2011]. The Probable lethal dose of fluoride is less than 5 mg/kg [Gosselin 1984, Akinawa 1997]. Fluoride acts as a barrier-breaking agent, inducing ultra-filtration of fluoride form the interstitium into the gastric lumen accompanied by an increased acid back-diffusion.

Symptoms as reported during epidemiological survey at target place include headaches, burning eyes, nose or throat, concentration or memory lapse, nausea, stomach problems, muscle pain, dizziness and fever, etc. It's time to implement a comprehensive campaign on water De-fluoridation and forcing local habitat for safe use of drinking water.

Keywords: Gastrointestinal tract, Autopsy, Interstitium, Epidemiological.

R46: Green Fuel from Green Source Using Green Catalyst

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Continuous environmental degradation makes life on earth in a jeopardized situation. Green thinking only makes our life safe at this moment. Based on this idea, present paper identifies green fuel like biodiesel from green sources like non edible oils using green catalyst like enzyme catalyst. A comparative study has been made between Jatrophacurcas oil and Jojoba oil for biodiesel production using enzyme catalyst Novozyme 435 (Candida antarctica) at 65^0C temperature with 1: 6 molar ratio of oil to methanol maintaining a mixing intensity of 600rpm. Both the oil contributes good conversion but Jatropha circus oil is better w.r.t. fuel properties and ultimate use. This green technology is the ultimate solution of energy scarcity along with environmental sustainability.

Keywords: Biodiesel, JatrophaCurcas oil, Jojoba oil, Candida antarctica.

SYMPOSIUM-II

Environment and infectious Disease

R47: Characterization of targeted bioactive molecules for Nano-Sponge drug development isolated from halophilic actinomycetes having potential anticancer and antibacterial properties

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Halophilic actinomycetes are producers of various bioactive compounds. The purpose of this experiment is to isolate nano- sponge incorporating drug formulation for antidiabetic and anticancer bioactive compounds obtained from halophilic actinomycetes. Soil samples were collected from saltpans located in tamilnadu, India. The isolated halophilic actinomycetes were screened against diabetic wound pathogens by disc diffusion assay. The potential strains were identified morphological, physiological and biochemical characteristics for genus level identification and molecular profiling by 16 srRNA sequencing for species level identification. Potential strain is identified by whole genome sequencing methods. solvent extraction method used for crude extraction and check the antibacterial activity. The potential crude extracts were subjected to the silica gel column chromatography technique. The active fractions from column chromatography were purified by HPLC technique. The purified fractions were screened for antibacterial activity by disc diffusion method and anticancer studies by MTT assay, Apoptotic cell death, Scratch wound healing assay. The Purified fraction is characterized using UV-vis spectrophotometry, FTIR and NMR analysis. In-silico analysis of isolated compound and targeted protein pathogens were used for molecular docking studies. In current study, different formulation of drugs loaded into nano-sponges for drug development.

Keywords: Halophilic actinomycetes, Saltpan, Nano- sponge, Diabetic wound bacterial pathogens.

R48: Modelling Agroecological Landscape Dynamics in Northern Dry Zone of Karnataka

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Monitoring the landscape dynamics through quantification of land use and land cover (LULC) aids in understanding landscape structure and composition. Large-scale changes in land use are due to increasing anthropogenic pressures including agricultural expansions. The current study analyses the spatial patterns of temporal changes in the agroecological district Bagalkot through the advanced machine learning techniques using temporal remote sensing data. The quantification of land use dynamics would provide vital insights for sustainable management and protection of the land resources in the Northern Dry Zone of Karnataka. LULC changes were quantified using Landsat data from 1973 to 2022 through Random Forest algorithm, a supervised machine learning technique, which aggregates many decision trees and while minimising overfitting and error due to bias, which would yield result with higher accuracies. The analysis revealed decline of forests from 16.1% to 9.48% during the past five decades. Agriculture and horticultural activities increased with the availability of water with the construction of the Almatti dam over the Krishna River in 2005. The stream network of Krishna, Ghataprabha and Malaprabha rivers have supplemented the irrigation. The district is also experiencing rapid urbanization, evident from the increase of paved surfaces from 27.09 sq. km (in 1973) to 173.19 sq. km (in 2022). The health and structure of forests from 1973 to 2022 was assessed using fragmentation indices, which shows a decline in interior forest area from 12.92% to 6.12% due to the conversion of forest area into monoculture plantations and agricultural lands. Further, likely land uses for 2030 and 2038 were analysed using the Cellular-Automata-Markov modelling. The simulated result illustrates of further degradation of forest to 340.5 sq. km and an increase in built-up up to 206.78 sq. km in 2038.

This information helps the decision-makers to frame an appropriate land use policies for sustainable management of natural resources.

Keywords: Land use land cover, Machine Learning, Random Forest, Forest Fragmentation, CA-Markov, Land use Modelling

R49: NEAR SURFACE TEMPERATURE LAPSE RATES FOR TREELINE ENVIRONMENT IN WESTERN HIMALAYA AND POSSIBLE IMPACTS ON ECOTONE VEGETATION

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This study presents the maiden results of near surface temperature lapse rate (TLR) for treeline environment in the western Himalaya in India based on ground observations along an elevation transect (1500-3680 m). Statistically significant correlation and linear regression model was used to calculate TLRs for different months. The mean annual TLR in western Himalaya is less steep (0.53^{0}C/100m) than the commonly used value (-0.65^{0}C/100m). Notably, the lapse rates of temperature varied across different seasons and the two study aspects suggesting that TLR is governed by several micro-climatic and physiographic features. The highest mean TLR (-0.64^{0}C/100 m on NW aspect and -0.60^{0}C/100 m on SE aspect) was observed for pre-monsoon season (March-May) whereas the lowest (0.42^{0}C/100 m on NW aspect and -0.39^{0}C/100 m on SE aspect) for the winter season (December February). The annual cycle of TLR reveals a bi-modal pattern with two maxima in the pre-monsoon (associated with strong dry convection) and post-monsoon (relatively small thermal forcing) seasons whereas two minima in winter (strong radiative cooling) and monsoon, respectively. The higher TLR in dry or warmer and lower in humid or cold atmospheric conditions suggest different controlling factors determine TLRs in the individual seasons. There is a need to examine whether the low TLR of the present study transect (-0.53^{0}C/100m) is because of elevation-dependent warming (being more in higher elevations) under the influence of global climate change. The observed shallower TLRs, an indication of elevation-dependent warming in Himalaya, may have several implications on ecotone vegetation in Himalaya under changing climate scenarios.

Keywords: Temperature lapse rate, Treeline environment, Ecotone, Elevation dependent warming, Western Himalaya

R50: Unifying Education And Environmental Sustainability Through Green Auditing

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Teachers are the FACILITATORS who have the great responsibility to make residents of the planet earth which is the only space for their existence. To protect and conserve the earth's environment, teachers have to address a number of issues ranging from climate change to the elimination of nuclear weapons and encouraging ecologically safer farming practices. Actions must be taken first to minimize the harmful waste. School creates a lot of waste each year. Schools should maintain recycle bins separately. Students need to be sensitized towards this to ensure environmental education at school and ultimately to reach society at large. In the present paper the students are taught to undertake GREEN AUDITING project for different types of waste generated in their campus.

Keywords : Environment awareness, climate change, Green auditing

R51: Restoring Conservation Forests In Southern Western Ghats And The Monitoring Of Frugivorous Birds

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The hornbills come under the family Bucerotidae and the order Bucerotiformes. While most forest birds probably feed on insects, worms, and small animals. But these birds rely on fruits for a large part of their diet. Many studies report on frugivory by hornbills but few specifically identified hornbills are unlikely to routine with degraded areas newly planted in the young trees. Over the last seven decades, about 40% of natural forest cover was lost in the Western Ghats due to various anthropogenic pressures. The hornbill species population is declining due to various threats perhaps habitat degradation is a major threat for hornbills in the southern Western Ghats of Tamilnadu and Kerala.

Keywords: Hornbills, Seed dispersal, Tree, Western Ghats, Kerala

R52: Assessment of Ground, Pond, River and Canal Water Quality in Some Muncipal, Residential, Industrial & Port Areas

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The characteristics of water, air and soil having physical, chemical and biological are undesired changes. So in the Globe; people are under tremendous threat. Water is highly polluted with different harmful contaminants due to manmade activity. Leaching of soils, industrial processing, residential- municipal waste etc. and weathering of rocks; natural water contaminates. Varied of water borne diseases is suffered by human being due to use of contaminated drinking water. So it is necessary that at regular time interval quality of drinking water should be checked. Different physicochemical parameters are used with the calculation of WQI for testing of water quality.

Keywords: Water, Physicochemical Parameters, WQI.

R53: Land Use/Land Cover Changes Detection of Built-Up Land in Yadgir District, Karnataka, India-Using Geospatial Technology

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Mapping and monitoring of land use/land cover (LU/LC) changes in the Yadgir district is vital for sustainable development, planning and management. Based on Geographic Information System (GIS) and Remote Sensing (RS) techniques, the WORK HAS BEEN attempted to monitor the changes in LU/LC patterns of Yadgir district for the periods 2000, 2005, 2011, 2015 and 2020. Study has been carried out through images from Landsat, Thematic Mapper (TM) from 2000 to 2020. The LU/LC classification maps were prepared through remote sensing and GIS technology. The results indicates that there was a significant increasing trend in built-up land. LU/LC in the study area was found changes over the past two decades. Three major built-up classes viz; Industrial area / Mining / Quarry, Built-Up Rural and Built-Up Urban land have been identified in the study area. The overall results were shows that the built-up land was observed to be increased 0.05% (761.9 hectare) in 2005, 0.10% (1312.7 hectare) in 2011, and found be decreased 0.01% (1376.2 hectare) in 2015, and 0.04% (1636.0 hectare) in 2020. The analysed and findings of these studies may highlights the important policy implications for the sustainable LU/LC management in the Yadgir district

Keywords: Built-Up land, LU/LC changes detection, RS and GIS softwar , Yadgir District.

R54: A Case Study of Knowledge, Attitude and Practice About Bio-Medical Waste (Bmw) Management Among Health Care Personnel and Its Impact Upon BMW in Siwan, Bihar, India

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Any emerging issue needs a good knowledge to handle it and knowledge makes practice and attitude about that concerning issue. In the same manner Bio-medical waste (BMW) management is an emerging issue for now a day and it also needs a good knowledge, attitude and practice to handle it properly, scientifically and cost effectively. Without knowing its dire state nobody would take it seriously. There is a lot of problems arise due to improper management of BMW. One side it pollutes whole environment and other side it is a major cause of nosocomial infections and responsible for so many deadly diseases. Siwan (Bihar, India) is a highly potential patient belt having a lot of private and government health-care facilities and producing a massive amount of BMW. So, the main aim of this article was to assess the knowledge, attitude and practice (KAP) about BMW and its impact upon BMW. In my present study 51.4% of health-care personnel were found to have an adequate knowledge, attitude, and practice about BMW and nearly 10% health-care facilities were equipped with Effluent Treatment Plant (ETP) for wastewater treatment process (WWTP) in the town, while 90% of hospital's drainage system is directly mixed into domestic drainage system without any scientific treatment and finally released into Daha River of Siwan (Bihar). In this way potential diseases causing micro-organisms are reached to Daha River through all over the town and pollute whole environment of the town.

Keywords: Nosocomial, Attitude, Scientific, KAP, ETP

R55: Studies on Health Status of Fluorosis Affected Inhabitants In Some Specific Villages of Rajauli

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The intake of fluoride rich water above the maximum permissible limit of 1.5 mg/L leads to a disease called fluorosis. Rajauli block of Nawada district, Bihar is one of the worst fluorosis endemic areas. Inhabitants suffering from dental, skeletal and non-skeletal fluorosis have been found in the villages of Rajauli block. A total of 44 samples from different water sources of Hardia Sector D, Singar Khas, Hanuman Nagar and Bhaunr were analysed by the Ion Selective Electrode Method at the 'Centre for Fluorosis Research, Department of Chemistry, A.N. College, Patna.' Out of the 44 samples, 41 water samples were contaminated with fluoride. To identify the fluorosis affected people, health status survey was done. The height and weight of the villagers (who were above 6 years of age) were measured and the BMI (Body Mass Index) values were calculated. During the health survey many people of the village reported dental problems, muscular pains, joint pains, bone deformities and many more ailments related to fluorosis. Some cases of knock knee and bow legs were also observed . Many of the inhabitants had their BMI level less than 18.5. In some villages of Rajauli, the use of Moringa oleifera has started giving positive results. The leaves and fruits of Moringa oleifera are consumed by the people as a nutritional supplement and has led to reduction in severity of the disease.

Keywords : fluorosis, endemic, inhabitants, deformities

R56: Antibacterial Screening and Chemical Characterization of Bioactive Compound from Wheat Grass

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In in the recent years, research on drug development is increasingly focusing on herbal or alternative medicine. Wheat Grass (Triticum aestivum L.) is a member of Poaceae family, and is known to be a nutritional powerhouse. The present study deals with the comparative study of antibacterial screening of Sharbati and Lokman varieties of fresh wheat grass juice with Sharbati wheat having the best zone of inhibition indicating its high antibacterial potential. Further in the GC-MS analysis among all the selected solvents, methanol was found to be good solvent extract which showed the positive result for the chemical characterization of a number of bioactive compounds. Beta amyrin is a bioactive compound found in the GC-MS result is widely known to act as an ideal anti-inflammatory and antifibrogenic agent, also exhibiting the significant anti-cancerous activity.

Keywords: Antibacterial, Wheat, Amyrin, Bioactive Compounds

R57: Characteristic Case study of Physiochemical Assessment and Contamination Status of Ground waters in Penumarthi Kakinada District - AP, India

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The suitability of water for various domestics, Irrigation and drinking applications was studied by analyzing samples from different sampling sites, located in and around industrial areas in East Godavari. The present research work evaluates the Chemical and heavy metal Toxicity in the ground water and Soil in the parts of East Godavari area around 20 Ground water samples, identified and collected for chemical, analysis. The Ground Water contamination has become a grave problem due to rapid growth of population, expansion of irrigation activities, industrialization and high rate of urbanization in India. GW is an important resource for drinking purpose which contains over 90% of the fresh water resources. The untreated industrial effluents discharged into the surface water sources cause severe Ground Water pollution in the industrial belt. The evaluation was done by the chemical characterization by measure of contamination levels with the Ground waters samples were collected and analyzed for The purposes of this study are, specifying spatial distribution of groundwater quality parameters such as Chloride, Electrical Conductivity (EC), pH, hardness and sulphate groundwater quality for drinking purpose by employing Analytic Hierarchy Process (AHP) method in the research work. The research results reveals that their common origin, especially from industrial effluents and municipal wastes that are responsible for the enhancement of these toxic metals as moving together in groundwater higher values of physicochemical parameters reveal the anthropogenic sources of these variables. The high concentration of heavy metals in groundwater water may cause serious threat to public health as well as the aquatic environment.

Keywords: suitability, Chemical, Toxicity, contamination, characterization, Irrigation, Physicochemical, Public health

R58: Corrosion protection of Al in Carbon dioxide environment by tetrahydro-dibenzo[a,d][7] annulene-5,11-diphenyl hydrazone and V_2O_3

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Aluminium is an important engineering metal so it is used in the field of various appliances. Carbon dioxide create hostile environment for aluminium. It absorbs moisture to form carbonic acid and produce acidic medium for aluminium. It developed corrosion cell on the surface of aluminium. The corrosion reaction takes place and aluminium is oxidized into Al^{+3}. On the surface of aluminium observed galvanic, pitting, crevice, stress, strain, cyclic and fretting and fatigue corrosion. Aluminium corrosion protected by the nanocoating of tetrahydro-dibenzo[a,d][7]annulene-5,11-diphenylhydrazone and electrospraying of V_2O_3. The corrosion rate of uncoated and coated aluminium was calculated by weight loss experiment at different concentrations temperatures and days of nanocoating comound tetrahydro-dibenzo[a,d][7]annulene-5,11-diphenylhydrazone and electrospraying of V_2O_3. The corrosion electrode potential and current density of uncoated and coated aluminium was determined by potentiostat techniques. Laser spray used for nanocoating of tetrahydrodibenzo[a,d][7]annulene-5,11-diphenylhydrazone and electrospraying of V_2O_3. The surface film composite barrier formation was studied by Langmuir, Freundlich amd Temkin isotherm. Both compounds attached with aluminium by chemical bonding. The chemical bonding formation was confirmed by activation energy, heat of adsorption, free energy, enthalpy and entropy. The surface coverage area and coating efficiency results were shown that coating compound tetrahydro-dibenzo[a,d][7]annulene-5,11-diphenylhydrazone and electrospraying compound V_2O_3 have low dose coveted more surface.

Keywords: surface coating, composite barrier, carbon dioxide, electrospraying, chemical bonding.

R59: Soil Respiration in Different Land Use Systems in Manipur

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Soil respiration is the efflux of CO_2 from soil that results from the combined rates of autotrophic (root) and heterotrophic (microbial and soil fauna) respiration. Decomposition of soil organic matter by soil microorganisms is the major component of soil respiration. In terrestrial ecosystem, CO_2 release through soil respiration is approximately 11 times more than the contribution from fossil fuel burning .Under a range of environmental conditions , soil respiration varies among different ecosystems.

A study was conducted at three different land use system of Manipur, North-east India vizin sub-tropical forest located between 24°45' N and 93°55' E at Khonghampat, 12 Km from Imphal city, the community protected forest (Sacred grove) located between 24.764° N and 93.858° E at Konthoujam village, 11 Km west of Imphal city and the traditional agroforestry ecosystem (Home garden) located between 24°52' N and 93°54' E at Khamram village, 14 Km from Imphal city. Maximum rate of soil respiration was recorded in the month of September and minimum in the month of January for all the three sites. An analysis of variance indicated a significant difference in soil respiration rate between the different sampling months of summer ($p < 0.05$), rainy ($p < 0.05$), winter ($p < 0.05$) and annually ($p < 0.05$). The rate of soil respiration, was found to be positively correlated with the abiotic factors i.e. soil moisture, soil temperature, soil organic carbon and negatively correlated with soil pH.

Keywords: CO2 efflux, Respiration rate, abiotic factors, landuse systems

R60: Bioremediation of Antibiotic Residues Using Bio Adsorbents

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Antibiotics are frequently used to treat and prevent illnesses in both humans and animals. However, overusing these antibiotics for a variety of reasons ultimately leads to the deposition of dangerous antibiotic residues, often known as emerging contaminants. These dangerous substances are spread via the food chain. Animals are administered excessive amounts of antibiotics for the improvement of their health, the production of milk, eggs, meat, and other products, and as a result, hazardous antibiotic residues are left in the animals' bodies, milk, and eggs. These same foods are being consumed by people and are tainted with dangerous substances. Most significantly, pharmaceutical companies, hospitals, and homes all dump antibiotic residues into wastewater treatment facilities. Water serves as a good reservoir for bacteria, allowing them to grow, multiply, and spread the phenomena of antibiotic resistance from one bacterial cell to another. These leftovers may pose threats to the environment and to human health. Therefore, effective antibiotic residue cleanup from wastewater and other aquatic settings is required to reduce these dangers. Antibiotic resistance genes (ARGs) found in wastewater and other aquatic habitats cannot be inactivated using standard remediation techniques. The most effective remediation method, however, is adsorption since it not only removes antibiotic residues but also antibiotic resistance genes and bacteria. This study offered insights into current research on improved, reasonably priced, and environmentally acceptable bio adsorbents used in this procedure for the effective removal of antibiotic residues from aquatic environments and their respective mechanisms.

R61: Analysis of Women's Perception of PMUY Scheme Using Path Model : A Case Study of Municipality Region

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Indoor air pollution is an often overlooked, yet an emerging cause of concern for women health and the environment. Sustainable development comes with efforts of minimizing pollution level, improving health conditions and adopting better energy sources. The Pradhan Mantri Ujjwala Yojana is such a scheme adopted in 2016 for rural women by the Govt of India. This study aims to analyze the exposure level of SPM10 and SPM2.5 the perception of urban poor women in a Municipality about their adoption of the scheme for a better health in future, with the help of the RIDIT Analysis and Mediation Path Model.

Keywords: PMUY scheme, Mediation Path Model, Indoor air pollution, Women's perception

R62: Earth For Each - Save Neighborhood Friends

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Not even humans, animals also are affecting by different types pollutions that can affect cause health issues like trigger asthma, diabetics, chronic obstructive pulmonary disease, lung issues, etc. The air pollution is increasing the risk of developing of coronary artery disease and acute cardiovascular events in animals. Permanent blindness, deafness, panic attacks and loss of appetite which could lead to the heart failures and finally death in animals, birds. Moreover, the most common howling and shivering while Indians bursts the crackers. The eposter introduces the seriousness about different pollutions causing health issues in animals and birds. This e-poster provide you the causes and impacts of stray dog problems, other animals and birds. Also it has proposals that can provide options to solve problems or proposed recommendations in terms of the solutions. Indiscriminate cut down of the trees in cities, reducing the trees diversity and sprayings of the chemicals polluting small lakes and these are causing issues for the neighborhood animals and birds in cites.

Keywords: Animal, bird, disease, health, pollution, problems, city, air, sound, waster, failure, trees, lakes.

R63: Impact of Illicit Cultivation and Trafficking of Narcotic Drugs on Environment

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Illicit drug production leaves its mark on the environment. Due to the clandestine nature of illicit drug production, its effect is highly destructive. This impact is caused by natural drugs, which are primarily extracted from a natural source such as cocaine, cannabis. The environmental impacts associated with such drug include deforestation, watershed depletion, on, greenhouse gas emission and biodiversity loss. Farmers using pesticides can severely affect the environment. Drug trafficking and illegal drug production with adverse effect often devastates the environment. The cultivation of plants being the source of illegal drugs results in soil damage, flooding and toxic chemical pollution.

Keywords: Cladestine, Cultivation, Drugs, Environment, Narcotic rcotic

R64: A Plant-Bio-Photovoltaic Device Power Driven for Green Electricity

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An energy crisis is getting worse every year in the world. Fossil fuels are responsible for the increasing price of fuels and the fact that they are becoming too exhausted and the grave concern over greenhouse gas emissions. Therefore, alternative sources of renewable energy such as Plant-Bio-Photovoltaic devices (P-BPVs) is the bio-electrochemical system for zero emission energy. It is conversion technology i.e., chemical energy into electrical energy is used as green electricity by using microorganisms that naturally occur in the soil which organic substances discharge by plant roots in terms of the photosynthesis process. This device serves as a replacement for the evolving microbial fuel cell. It was found that the PBPVs device with grass and without grass (control) appeared under the experimental in ambient condition for the voltage measured. The potential difference formed through Plant BPVs device was estimated with most extreme voltage produced among ambient conditions which was observed 0.60 to 0.70 ±2 Volts at 30th days respectively. While the other set of without grass recorded under above the same condition was power output 0.33±2V respectively at 30th days. This paper discusses a new progressive in light-harvesting technology that utilizes organic substrates for innovative options to demonstrate by the bio system involved in a broad range of solar cell research that estimates the limit of bio achievable power outputs for potential application of Plant-BPVs technology.

Keywords: Plant-BPV device; Cynodon dactylon; Sustainable Energy; Electricity Generation.

R65: Comparative Degradation Kinetics of Various Advanced Oxidation Processes Used in Remediation of Wastewater Laden with Aqueous Paminobenzoic Acid

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In this paper the emerging contaminant aqueous para-amino benzoic acid was treated by photo peroxidation (UV/H2O2), photofenton (UV/Fe2+/H2O2), ozonation (Only O3), peroxone (H2O2 /O3), photo-ozonation (UV/O3), photo-peroxone (UV/O3/H2O2) processes. The experiments were taken out in a batch photoreactor using 8W low pressure mercury vapor lamp to examine the effects of different combinations and their degradation rates are compared. Substrate concentration was fixed by utilizing a UV-Visible spectrophotometer. The results indicated that the rate of degradation follows the following sequence; photoperoxone > photo-ozonation > peroxone > ozonation > photofenton > photoperoxidation. The photo degradation processes were adhered to first order dynamics.

Keywords: p-amino benzoic acid, photo-peroxidation, photo-fenton, photo-ozonation, photoperoxone, first order dynamics

R66: Effect of ascorbic acid on growth and lipid peroxidation level of Triticum aestivum L. under chromium (VI) pollution

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Heavy metal contamination in soil and groundwater can be caused by the growing use of chemical fertilizers, insecticides, and pesticides, posing our environment and affect the human health. Heavy metals can also affect crop yield. A hydroponic experiment was conducted in the culture room of P.G. Department of Environmental Science, Fakir Mohan University, Balasore, Odisha. It intended to find out the effects of ascorbic acid application at three concentrations (1.0, 2.0 and 4.0 mM) on the growth, total chlorophyll and lipid peroxidation level of seven days seedling of wheat plants (Triticum aestivum L.) under 1.0 mM concentration of Chromium (VI) along with half strength Hoagland solution. The results showed that the combined application of ascorbic acid at 1.0 mM and Cr (VI) at 1.0 mM led to increase growth parameters of wheat (Triticum aestivum L.) (i. e. root length, shoot length, and fresh and dry weight of both root and shoot part of the plant) as well as total chlorophyll content and decrease lipid peroxidation level as compare to 1.0 mM of Cr (VI). The same tendency was observed at the combined treatment between ascorbic acid at 2.0 mM + Cr (VI) at 1.0 mM, ascorbic acid at 4.0 mM + Cr (VI) at 1.0 mM. The data also indicated that the highest values of plant height, root length, shoot length, fresh and dry weight of shoots and roots were obtained from wheat plants treated with ascorbic acid at 2.0 mM combined with Chromium (VI) at 1.0 mM. Moreover, the combined treatment between ascorbic acid at 2.0 mM + Chromium (VI) at 1.0 mM led to significantly increased root length and shoot length.

Keywords: Heavy metals contamination, hoagland solution, total chlorophyll content.

R67: A study on fluorosis Health Problems and Removal of Fluoride Content in Drinking Water by Adsorption Method

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Fluoride at low concentration is an essential element for dental health. Exposure to high fluoride levels (greater than the WHO limit of 1.5 mg/L) in drinking water cause endemic dental and skeletal fluorosis, and crippling. Therefore, maintaining of fluoride concentration within the safe limits is very important. In the present study Mashihal Village from Devadurga taluk, Raichur district have been selected to assess the ground water quality. The result of the study reveals that fluoride range was recorded 4.4 to 6.4 ppm. Health problems such as dental and skeletal fluorosis problems were noticed. Prosopis juliflora Plant bark material adsorbent was prepared for adsorption study. The results reveal that 91.4% of fluoride removal in 7ppm of fluoride sample at pH 5was recorded. Therefore, it is clearly evidenced that Prosopis juliflora adsorbent witnessed as promising level of adsorbent.

Keywords: Groundwater, Fluorosis, Adsorbent, Health hazards, Mashihal village

R68: Sustainable Future Green School Ecology: Prevents Future-Pandemic Improving Biomedicines-Physiology Health Technology Biodiversity World Policy Development Studies

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The various lockdowns due to the severe acute respiratory syndrome coronavirus 2/3 (SARSCoV-2/3) – 2019 (COVID-19 diseases) from March 2020 to up-to-date 2022, and the recent; 'Freshwater-Living-Pathogens', infectious viruses 'hitchhike' on latching onto microplastics, missing our helpful guts-microbes, and the outbreak of Monkeypox, etc., and the 'Future Pandemic', has badly affected a worldwide school education; straightforward teaching, health, nutrition, research, and well-being due to their epidemic potentiality and insufficient countermeasures or vaccines or weakening the ability of vaccines to prevent diseases caused by pathogens. So, in the year of 'Azadi Ka Amrit Mahotsav', to overcome it, the main objective is to develop 'Sustainable Future Green School Ecology' for sustainable teaching practices during any future pandemic. The survey-based/design study has mainly conducted in the Kanchannagar D. N. Das High School (HS), and the students has identified patterns, trends and problems in lockdowns based on interaction-survey among themselves, teachers, and communities, and mentions some of the solutions deployed to overcome the problem by innovative ideas regarding hybrid learning, health, infrastructure, and biodiversity conservation wildlife for joyful environment with treatment clues against diseases or infectious disease diagnostics, surveillance, vaccine development, and therapeutics, that will enable a to prevent any global pandemic, and take more advantage of modern environment friendly technologies to continue teaching during any lockdowns for; "Understanding Eco System for Health and well-being" and "Fostering health, nutrition, and wellbeing/Technological innovation for ecosystem and health with the steady reopen opening", and the 'School will be the mirror of the society by improving 'Sustainable Future Green School Ecology' forming the 'Common-Activity-Based-Eco-friendly-Complex-Ecosystem Model' that prevents any future pandemic improving "Biomedicines-Physiology-Health Technology-Biodiversity-World Policy and Development-Studies". And it will encourage children to find local-level problems and take initiatives for

developing local technological solutions from green technology, appropriate technology, information and communication technology, or improvising traditional biomedicines-physiology technology based on the principles of frugal innovation.

Keywords: Sustainable-Future-Green-School-Ecology; Prevent; Future-Pandemic.

R69: Biomolecular Receptor For Bioremediation

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Biomolecules such as enzymes, plant cells, nucleic acids and structural modification act as sensing elements and perform as bioreceptor. The specific biological elements recognize specific molecule is usually converted into signals for morphogenic modifications and synthesis of specific protein .These elements possess much higher performance in terms of sensitivity, selectivity and stability.The experimental analysis that determines the sensing elements hit the target analyte. The experimental living microorganism Gloeotrichea echinulata also works in the form of biofilm to carry out the function for bioremediation of different phosphates in the culture medium and coupling of urea in the medium emerge as booster.

Keywords: Biomolecules, Bioreceptor, Bioremediation, Biofilm, Gloeotrichea echinulata, Phosphates, Urea, Booster.

R70: Lingering Effect of PGPR And Nutrient Recycling In Agricultural Congeniality of East Kolkata Wetlands

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Wetlands, include an interface of land and water having a rich biodiversity with multifarious functions. According to Ramsar Convention, August 2002, East Kolkata Wetlands have been considered to be of international importance. Although improper management of these wetlands, has led to the gradual degradation of this wetland. In this present study, the soil sample was collected from these reclaimed agricultural lands of Chowbaga area, of East Kolkata Wetlands with coordinates of 22.5296°N, 88.4207°E, and their physico-chemical parameters during the initial, peak and inter cropping periods of Cucurbita maxima and Zea mays were analysed. The dissimilitude in the values of their physico-chemical parameters like organic carbon, calcium, magnesium, cation exchange capacity etc indicate their influence in controlling crop productivity. Moreover, they also result in the variation of rhizospheric bacteria. The plant growth promotion properties of the lingering bacterial flora present in the soil surrounding the rhizospheric region of Cucurbita sp and Zea mays were analysed. These PGPR which included some species of Bacillus, that can augment plant growth by different methodologies like nitrogen fixation, phosphate solubilization, phytohormone synthesis, siderophore production. The prospective potential of use of PGPR has gradually escalated, since it is one of the best substitutes against the constant usage of chemical fertilizers as well as pesticides. The use of these PGPR is one of the most reliable methods for ensuring sustainable agriculture. Subsequently, the PGPR population will be correlated with the nutrient availability and productivity of the plants

Keywords: East Kolkata Wetlands, Cucurbita sp, Zea mays, physico-chemical parameters, soil, microbial flora, PGPR

R71: Futuristic approach to protect Sundarbans

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The Sundarbans is the world's largest littoral forest and is an area of rich heritage and biodiversity. It has a vast location which includes the river Baleshwar in Khulna, Bangladesh, to Hooghly, West Bengal. It protects the coastal habitat from devastating cyclones, helps in the reclamation of the land, acts as a natural flood barrier, and provides a livelihood for local people. Due to anthropogenic factors which are leading to global climate change, the current status is that – there is an increase in the mean sea level, thereby posing a negative impact on the Sundarbans. This is causing salinity intrusion which is a major threat in most parts. It is leading to soil and river salinization, hence affecting people, their livelihood, and their occupation. There is a loss of income, a decrease in freshwater for drinking and irrigation, alteration in mangrove ecosystems, and agricultural loss. Moreover, this is leading to a rapid decrease in many native species of plants and animals. The Sundarbans soak a huge amount of carbon dioxide, thus the increase in salinity can lead to an increase in the amount of carbon. If this continues, in the next twenty years, there would be 98 percent inundation of Sundarbans. Hence, the solutions for these problems include – regular tree plantation in every house which should be a conscious personal initiative, propagation of roots using microbial consortia, freshwater management, reshaping the land, and alternate livelihoods such as handicrafts, pharmaceuticals, honey processing, tannin, and dye processing can be adopted. Sustainable farming and the use of biomass energy instead of wood as a fuel for cooking also create an impact. It is necessary for researchers and other people to reach out to the dwellers there and provide them with essential help.

Keywords: Sea level rise, salinity intrusion, soil and river salinization, Sundarbans, inundation, ecological imbalance, climate change, microbial consortia.

R72: Green Fuel From Green Source Using Green Catalyst

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Abstract: Continuous environmental degradation makes life on earth in a jeopardized situation. Green thinking only makes our life safe at this moment. Based on this idea, present paper identifies green fuel like biodiesel from green sources like non edible oils using green catalyst like enzyme catalyst. A comparative study has been made between Jatrophacurcas oil and Jojoba oil for biodiesel production using enzyme catalyst Novozyme 435 (Candida antarctica) at 65^0C temperature with 1: 6 molar ratio of oil to methanol maintaining a mixing intensity of 600rpm. Both the oil contributes good conversion but Jatropha circus oil is better w.r.t. fuel properties and ultimate use. This green technology is the ultimate solution of energy scarcity along with environmental sustainability.

Keywords: Biodiesel, Jatropha Curcas oil, Jojoba oil, Candida antarctica.

R73: Assessment on Postural Analysis among School Going Students with Respect to School Bag Weight in Nagpur City

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Children undergo rapid musculoskeletal development; the external force of a heavy school bag may cause musculoskeletal disorders. Children use school bags to carry their study material. Along with it play kits, tiffin baskets and much other stuff are carried in the bags, making it heavier. These loads on child's back arises risk of developing backpack syndrome. Bag weight therefore should be reduced, it is said that a school bag should not weight more than 10 – 15 % of child's body weight. The current study was to determine musculoskeletal pain among school going girls, to check the anthropometric measurements and to examine their physical fitness. A survey cum experiment method was used to collect data. According to the findings, 38% respondents carried a bag weighing 5 kg and only 1% of the respondents carried a bag weighing 2 kg to 3kg each day. Respondent's minimum weight (kg) was 25kg and maximum weight was 63kg. Guidelines and recommendations were provided to reduce load of heavy bag on back. The use of heavy school bags are predictors for musculoskeletal problems and disorders, therefore, there is a need to investigate further.

Keywords: Backpack, Musculoskeletal problems, Posture, Anthropometry.

R74: Assessment of Surface Water of Mahanadi River Through Water Quality Index at Cuttack and Paradeep, Odisha

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Water plays a central role in all aspects of life. Quality of water is degrading, so day by day aquatic ecosystems getting challenging environment for survival of aquatic flora and fauna. Contamination of water by natural and anthropogenic activities was continued, since the beginning of human development. The deteriorating water quality and pollution of aquatic ecosystems become a global concern. River Mahanadi is the lifeline of Odisha. Various physico-chemical parameters were analyzed from March 2020 to February 2021 in four different seasons (Winter, Summer, Monsoon and Post-monsoon) to assess the fitness of water for a variety of uses. During the investigation, the parameters at monitoring sites were assessed and used for the determination of water quality indexing (WQI) of the river. The Mahanadi river water needs a suitable treatment method as well as preventive measures to curb the diminishing water quality which is clearly established through the average value of the parameters and that of WQI.

Keywords: Water quality index, Surface water, Mahanadi River, Physico-chemical parameters

R75: Diversity and Status of Avifauna in Agricultural Landscapes: A Case Study From Haryana, India

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Agricultural landscapes provide a variety of habitats and support rich diversity of avifauna. Bird surveys were conducted from April 2016 to March 2017 to document diversity and temporal variation of the bird community in agricultural landscapes of Panipat district of Haryana. Point-transect and direct observations were used to record bird species. A total of 103 bird species belonging 44 families and 15 orders were recorded. Passeriformes was the most dominant order with 20 families and 48 species. Ardeidae was the most diverse family in the study area. The agricultural landscapes provided habitat for 80 resident species, 17 winter migrants and 6 summer migrants. Most bird species were insectivorous (35) followed by carnivorous (27), omnivorous (26), granivorous (9), frugivorous (5) and nectarivorous (1). Species richness, abundance, diversity and evenness differed significantly ($p < 0.05$) between seasons as well as among agricultural landscapes. Among recorded avifauna, four species are listed as near threatened in International Union for Conservation of Nature (IUCN) Red list; six species are listed in Appendix II of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and five species are included in Schedule I of the Indian Wildlife (Protection) Act, 1972. In addition to this, the region also supported 26 species of birds having a declining population trend globally. This study will provide a baseline for future research on management and conservation of existing bird diversity in agricultural landscapes which are continuously subjected to anthropogenic pressures.

Keywords: Avifauna, Agricultural landscape, Diversity, Conservation, Haryana, India.

R76: Ground Water Quality Assessment Using Water Quality Index: A Case Study of Tirupati Rural Micro Watersheds

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The assessment and management of water quality and quantity are indispensable impact on our lives. The quality of surface water or groundwater at inlet, outlet and at any point of watershed shows variation in physical, chemical, properties. Due to the passage of water on the surface and in subsurface, the ions dissolve from soil particles, sediments, and rocks may influence the chemical composition and quality of groundwater. The concept of Water Quality Index (WQI) indicates the overall water quality at a certain area and time based on several water quality parameters. WQI reflects a composite influence of contributing factors on the quality of water. Water quality index (WQI) is calculated from the point of view of suitability of groundwater for human consumption. The Sodium adsorption ratio (SAR) is an irrigation water quality parameter used in the management of sodium-affected soils. It is an indicator of the suitability of water for use in agricultural irrigation, as determined from the concentrations of the main alkaline and earth alkaline cations present in the water. Exchangeable Sodium Percentage (ESP) is determined to know the ESP percentage in the soil.

The study area is located in Survey of India (SOI) Toposheet no. 57 O/6 with an extent of 129.64sqkm. To assess the ground water quality of eight locations in Tirupati rural areas have been selected. Climate of the area is semi arid. The proposed area is composed of plains, undulated land and hill areas with granite gneisses. The surface water source in the study area is very meager and their availability is seasonal. Hence, the groundwater is the major source for irrigation activity. After analysis of various physico-chemical parameters, we observe the range of WQI from 80.22 to 134.27. The highest value of WQI is observed at sampling stations 5, and the lowest values of WQI is observed at sampling stations 1. Sample stations 1 and 7 come under good water quality and 2,3,4,5,6,8 belong poor quality. The high value of WQI has been found to be mainly from the higher values of sodium, chloride and sulphate in the groundwater. The analysis reveals that the groundwater of the area needs some degree of treatment before consumption. Except Durgasamudram all the locations are showing high Exchangeable Sodium Percentage. Based on the SAR values it is observed that at Tanapalli area the water is having high SAR.

Keywords: Water Quality Index, Micro Watershed, Physico-Chemical parameters, Sodium Absorption Ratio, Exchangeable Sodium Parameter, Toposheet and Sampling stations.

R77: Physicochemical Parameters and Phytoremediation of Water Samples Of Laxmitaal Jhansi

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Water being the source of life is vital for all known forms of life. It is an excellent solvent used for all purposes of life like drinking, cooking, agriculture, industries etc and so its availability is decreasing. For the limited resource availability, reuse of the available supply is more suggestible. To maintain this, pollution factors in water bodies should be on regular check and if pollution exceeds it should be remediated. Many physical and chemical technologies prevail for remediation of water, but Phytoremediation is the best technique. This is a very eco-friendly technique which decontaminates the wastewater in a very economical way. The present study emphasise on Physico-chemical parameters measurement and heavy metal detection in LaxmiTaal, a local water body in Jhansi city of Uttar Pradesh. Physicochemical parameters like pH, turbidity, alkalinity, chloride content, total dissolved solids, BOD, DO and COD are measured every six months to observe the seasonal variations. Phytoremediation efficiency of Eichhornia and Hydrilla is examined by treating contaminated water of Laxmi Taal. The results revealed that many of the physicochemical parameters of Laxmi Taal water were in the range of pollution but after phytoremediation water quality is enhanced as the parameters towards pollution were greatly reduced.

Key words: Physico-chemical parameters, phytoremediation, Eichhornia, Hydrilla.

R78: Metagenomic Analysis of A Municipal Waste Water From Greater Kolkata

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The outskirts of Kolkata, as referred to as the Greater Kolkata, are lined with many industries, which are situated close to semi-urban residential areas. Often the industrial effluents are mixed with the municipal waste, after being discharged. Previous studies have shown that this mixed urban and industrial waste water may harbour aunique microbial population. There are possibilities of finding pathogenic bacteria, antibiotic resistant strains, strains tolerant to heavy metals and more. The aim of this investigation was to carry out the complete metagenomic analysis of the wastewater sample that was collected from a municipal waste water discharge point located in close proximity to some factories, in Khardaha, situated 32kms from the city centre, in order to classify and subclassify the microbial communities in a water sample. The heatmaps and krona chart obtained from the analysis were helpful in the visualisation or visual display of high-throughput sequencing analysis which was carried out using the Illumina NovaSeq 6000 system. The physical and chemical characterization of the waste water sample was carried out, which included analysing its pH, dissolved oxygen levels and electrical conductivity. It was also understood through literature that bioremediation and heavy metal tolerance of some of the communities' present can also be deemed as a serious aspect for further studies.

Keywords: Metagenomic analysis, heatmaps, Krona chart, high-throughput sequencing analysis.

R79: Potential Use of Honeybees and their Products as an Important Bioindicator for the Presence of Heavy Metals Contamination in the Environment

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In the current situation, various human activities have transformed the atmosphere, ocean, and earth at a global scale. As a result of this, there is an alteration in abiotic factors that interferes with microbial, plant and animal life, imparting a negative impact on human health, food security and biological diversity. These activities including mining, smelting, industrial work, use of agricultural pesticides, fertilizers, waste management plants, emissions through vehicles, industrial wastes and chemicals, etc. have led to a greater acceleration in environmental pollution. Among these chemical pollutants, heavy metals are extremely toxic and their exposure to living organisms causes a great problem by entering into the food chain. Because of their properties like non-biodegradable nature, long half-life and capacity to mobilize and disperse these are classified as the major group of inorganic pollutants as they interfere with various physiological processes. Heavy metals are constantly present in the environment due to their release through natural and anthropic sources. These heavy metals do not decay easily and because of their latent toxicity, they are unceasingly entering into the biological cycles thus being accumulated in the environment and getting into organisms of plants and animals. It is very difficult to assess the degree of environmental pollution resulting from human exposure to these hazardous toxic heavy metals. But utilizing biological indicators seems to be particularly suitable for indicating exposure to potentially toxic trace elements. Biological monitoring within a quality control program encompasses the systematic use of living beings for obtaining quantitative information on the alternation in the environment, often due to anthropogenic activities.

The potential use of insects as bio-indicators is not a newer technique but being applied for hundreds of years ago. Among insects, honeybees are very much sensitive to the alternation in the environment therefore, Apismellifera L. (Hymenoptera: Apidae), has been investigated as a potential bio-indicator to monitor environmental pollutants. The honey bee acts as an indicator of environmental pollution in two ways, either it signals via high mortality rates of larvae and adults or through the presence of toxic residues in honey, pollen and various hive products. As

the for aging honeybee visits an area of 7 km^2 around her hive for collecting nectar, water, plant resins and honeydew by visiting more than a thousand flowers during active hours. These heavy metals existing in the atmosphere can directly deposit on their body surface and reach the hive through these collected items. Analyzing these hive products such as honey, wax, pollen or the bees themselves can provide useful biological indicators for the pollution of water, air, soil and plants through heavy metals in an area of some square kilometers.

Keywords: Heavy metals, pollution, environment, bio-indicator and honeybees.

R80: Development of Eco-Friendly Method(S) for Reuse of Borne Out Surgical Instruments

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This work entails development of novel methods for the treatment of medical waste (the surgical equipment and prosthetics) to make it reusable. I specifically relates to removal of nickel toxicity from the used surgical instruments and prosthetics made up of Titanium using microbes to make it reusable. Titanium based instruments and prosthetics are used in medical sciences quite frequently. However these instruments and prosthetics need to be discontinued after a definite interval due to deposition of Nickel thereby resulting in toxicity. Efforts made to eliminate this metal toxicity using environment friendly methods. This work is fully focused on waste management with eco-friendly techniques as well as the Reuse of the Instruments which is becoming a threat to the Environment. So it is a step of Green Instrument.

Keywords: Surgical instruments, Titanium, Nickel, Lethal effect

R81: Biodegradation of chicken feather waste using bacteria isolated from dumping yards of Gujarat

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There has been a large increase in demand of chickens throughout the world with the increasing population of people dependent on non-vegetarian diet. A healthy chicken contains about 800 grams of feather in its body composition. These feathers are very difficult to degrade and act as a major pollutant in the environment. In present, these feathers are degraded through burning at the high temperatures and also used in landfillings which also increases the pollution in environment. The present, study will highlight on eco-friendly method of chicken feather degradation using bacteria. Chicken feathers are found to be very rich in proteins. As apart, the degraded chicken feather waste will also be used as an organic fertilizer in plants which will cure the plant infections caused due to deficiency of proteins and also used as growth boosters.

Keywords – Chicken feathers, Biodegradation, Bacteria, Organic fertilizer, plant health.

R82: Addressing Air Pollution in Delhi/NCR by synthesis of Environmental Science and Law – Role of Research and Policy Making

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Beginning right from the first world conference on Environment in Stockholm in 1972 to dealing with the various kinds of environmental issues and the immense amount of pollution, today, humans have certainly created a developed, scientifically rich, technically sound and progressive environment for themselves. However, the issues and concerns to protect and safeguard the natural environment remain as a major and a constant need. Both science and law find their basic source of existence in the grand environment that we live-in. Hence, very evidently and undeniably it becomes vital to sustain and protect the nature and develop along in harmony. Assistance of scientific evidence generates impeccable direction and aid to the legislators in policy building, especially on issues linked with pollution of the prime and crucial elements like the air. This paper focuses on the frightening issue of air pollution in the Delhi/NCR region and how the amalgamation of scientific research and aims of environmental law can lead in the creation of successful solutions to defend and safeguard environment from the harmful effects. To bring in and provide environmental justice, it extremely necessary understand and ensure unification of science and the law. An attempt to explain the current situation and to provide solutions on the massive issue of air pollution has been made through this study. Securing air pollution is equivalent to gifting freedom to breathe and live with dignity to the upcoming generations.

Keywords: Environmental Law, Scientific Research, Sustainable Development, Policy Making, Air Pollution, Environmental Science

R83: Hydrogen Economy: A Way to Bring Sustainability

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Hydrogen economy or hydrogen based economy is a vision of an energy delivery infrastructure based on hydrogen as a carbon free energy carrier. In order to phase out fossil fuels and limiting the climate change, hydrogen is perfect source to bring sustainability in energy sector. Hydrogen can be produce from renewable source like solar, wind or biomass energy to produce electricity and its combustion only releases water vapour as a by product. Hydrogen is mainly used as industrial feedstocks to produce ammonia, methanol and petroleum refining. Hydrogen is energetic fuel, frequently used as rocket fuel, but numerous technical challenges like storage, pipeline and engine equipment prevent the creation of large scale hydrogen economy.

Keywords: Hydrogen, economy, sustainability, renewable.

R84: Kartik PurnimaGanga Fair: Historical Fair of Hastinapur

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Fairs and festivals are the ancient cultural heritage of India. It is common in India to organize fairs on major festivals. Fairs, are means of enjoyment and, on the other side also sources of income. Devotees turn to fairs to fulfill their tradition, and on the other hand, fairs are also the main reason for burning the stoves of some people's homes. In such a situation, if we talk about the Ganga fair, then the importance of the event increases even more. Hastinapur is contained within the memories of the Mahabharata period. Hastinapur, from where many new traditions were formed, so did the end of many traditions. In the Puranic texts, one such tradition started from Hastinapur: Kartik Purnima Ganga Snan (bathing). Lord Shri Krishna started this tradition in Hastinapur after the end of the Mahabharata War.

Keywords: Kartik Purnima, Mahabharata, Hastinapur, River Ganga, Budhi Ganga

R85: Therapeutic Efficacy of Spirulina Platensis against Cadmium Sulphate Toxicity in the Histopathology of Liver in Clarias batrachus (Linn.)

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Spirulina platensis is cynobacteria which is used as a health product have many important nutrient used as a chelating agent to reduce the toxic effect of the heavy metal from the fish. Clarias batrachus is a important food fish in India affected by the cadmium contamination of the water resources. Clarias batrachus is a important food fish of India also affected by the cadmium pollution. Cd accumulates in the liver of fish through the digestion process and cause many histopathological alteration in the liver and reduce the function of metabolic process. To control this problem it is important to alleviate the heavy metal pollution in aquatic ecosystem through using suitable or low cost antidotes as using of Spirulina. Our study is based to observe the protective role of Spirulinaplatensis in the histological alteration in the liver of Clarias batrachus affected by Cadmium sulphate toxicity. During this experiment the fishes were divided into three groups, the first group served as control, group II treated with 1.39mg/l cadmium sulphate along with basal diet and group III feeded with Spirulinaplatensis supplemented diet along with cadmium sulphate for 30 and 45 days. After 30 days duration of time the liver of fishes of group II shows various histopathological alteration such as cytoplasmic vacuolisation with deshaped hepatocytes with enucleation and these alteration were more severe in 45 days in the liver and showed pyknosis, karyorrhexis, necrosis, cellular degeneration of the hepatocytes with dilation of sinusoids and blood vessels. When Spirulinaplatensis supplemented diet feed the fishes along with cadmium sulphate in group III it reduce the toxic effect of the cadmium and showed less histopathological alteration as in the fish liver as compared to cadmium treated group II.

Keywords: Spirulina platensis, Cadmium sulphate, Clarias batrachus.

R86: **Sustainable agriculture and Environmental management in Drought Prone Region: A Study on Rayalaseema**

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Out of the total geographical area of India, almost one-sixth area with 12% of the population is drought prone area; the areas that receive an annual rainfall up to 60 cm are the most prone. A drought prone area is defined as one in which the probability of a drought year is greater than 20%. A chronic drought prone area is one in which the probability of a drought year is greater than 40%.

The depletion of soil moisture, occurrence of drought, reduction, extension of cropping to sub-marginal areas to meet the production deficits, enhanced weed growth are the resultant impact of the degradation of soil and water leading towards environmental degradation in drought prone areas.

The Rayalaseema region is a geographic region in the Indian state of Andhra Pradesh. It is comprises eight south western districts of the State namely Kurnool, Nandyal, Anantapur, Sri SathyaSai, YSR, Annamayya, Tirupati and Chittoor districts. As for 2011 census of India, the region with four districts had a population of 15,184,908 and covers an area of 71,060 Sq.km.

A balance in the agricultural practices of the people and environment (soil, water and green cover) is possible by increasing the productivity and with an increase in the application of fertiliser and number of livestock without increasing cropping intensity, number as well as depth of bore wells in the study area. Drought was a major constraint in almost all the crops except for groundnut, red gram and cotton where, pests and diseases were the major constraints. In this paper has examined the linkages between agriculture and environment for their growth and sustainability without competing with each other Community decisions regarding controlling the livestock grazing has exerted an influence on the rejuvenation of green cover in the developed village.

Keywords: Agriculture, Sustainable development, Groundnut, Pesticide and droughtprone.

R87: Stat3 Induces IL-10 and SR-A/CD204 Expression in Silica Nanoparticles Triggered Pulmonary Fibrosis through Trans-activation

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Inhalation of silica dust in form of amorphous nanoparticles ($nSiO_2$) is associated with fibrosis and lung cancer and hence, has been considered as one of the most prevalent as well as the oldest known occupational and environmental disease worldwide.IL-10 is a pleiotropic Th2 type cytokine, has been found to associated with pulmonary fibrosis and is known to regulate its immunosuppressive activity via Jak/Stat pathway. The current study was, therefore, designed to elaborate the profibrotic role and the mechanism of IL-10/Stat3 in murine lungs following $nSiO_2$ tracheal instillation. Herein, we report that $nSiO_2$-induced fibrosis in mouse is rendered as a downstream molecular mechanism across IL-10/Stat3 immune axis and subsequently affecting SR-A/CD204, an important surface marker of pulmonary fibrosis. The work shall help in developing therapeutic intervention for silicosis.

Keywords: Silicosis, Stat3, IL-10, SR-A/CD204

R88: Two Contrasting Cases of Neurocysticercosis with Intraocular Cysticercosis – Why the Outcome was Different?

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Combination of parenchymal and intraocular cysticercosis is rare but potentially vision threatening if antihelminthic treatment is started without taking care of intraocular cysticerci. We present two cases of parenchymal and intravitreal cysticerci with contrasting outcomes and discuss factors which can affect the outcome. One patient, 19 year old presented with 10 days history of decreased vision in right eye with intraocular and brain parenchymal cysticerci detected on evaluation was managed with vitrectomy and removal of cyst followed by antihelminthic treatment along with steroids achieved good visual outcome while another patient, 40 year old with 6 months history of seizures and 5 months of decreased vision detected to have parenchymal and intraocular cysticerci managed similarly but his visual acuity didn't improved. These cases highlight that younger age of presentation, shorter duration of symptoms and earlier intervention is associated with better outcome.

Keywords : Neurocysticercosis, ocular cysticercosis

108th INDIAN SCIENCE CONGRESS
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V

ABSTRACTS OF POSTER PRESENTATIONS

SYMPOSIUM-I:

Environmental Conflict, Rights of Nature and Human Life

P01: Bio sanitizer with zero side effects

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The Covid-19 pandemic has shown that sanitizer is required at every level for sanitizing surface and our hands. Most of these sanitizers contain ethyl alcohol or isopropyl alcohol which may be harmful for our skin. In this paper, a novel bio- sanitizer has been proposed which reduces the harmful aspects of conventional and alcohol-based hand sanitizer. The novelty lies in the fact that bacteria isolated bacteriocins have been incorporated which is a potential antimicrobial agent. The bacteria for this purpose were non- toxic and the extract provided anti-microbial properties. The bacterial extract was mixed with plant extract derived from Aloe vera, babool and tea leaves which has given a balanced approach. The efficacy of the particular sanitizer is 95.4%.

Keywords-bacteriocin, plant extract, sanitizer, antimicrobial

P02: A Case Study of Ozone Layer Depletion

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The ozone layer is a region in earth's stratosphere that contains high concentration of Ozone & protects the earth from harmful UV radiations of the sun. Millions of people would develop skin diseases & may have weak ened immune systems in absence of ozone layer. However, sciencests have discovered holes in the ozone layer. Ozone layer depletion is the gradual thinning of the earth's ozone layer in the upper atmosphere Caused due to the release of chemical compounds containing gaseous bromine or chlorine From the industries or the other human activities.

Formation of OzoneLayer Ozone (03) chemically forms when UV hits on the stratosphere oxygen molecules dissociate into atomic oxygen sunlight O2 O+O Atomic oxygen quickly combines with other Oxygen molecules to form ozone O + O2 O3

Nearly 90% of the earth's Ozone Stratosphere is in the stratosphere . Ozone layer depletion happens when the chlorine & bromine. Atoms in atmosphere come in contact with ozone & destroy the ozone molecules . One chlorine can destroy 100.000. molecules of ozone It is destroyed more quickly.

Ozone depleting substances. Measure are cause. Chlorine containing ozone depleting substances. Include chlorofluorocarbons (CFC), carbon tetrachloride, hydrochloro fluorocarbons & methyl chloroform whereas, bromine containing ozone depleting substances are halons, methyl bromide andhydrobramo fluorocarbons CFC's are the most abundant ozone doplating substance. Exosphere, thermosphere, mesosphere, stratosphere ozone troposphere as the layers in the atmosphere.

Ozone is found in two different parts of Our atmosphere. Ground level or "bad " ozone Occurs in troposphere which is a human health. Irritant & a component of High level or ismog "good" ozone while the in stratosphere & accounts for the vast majority of atmospheric ozone. Stratospheric ozone layer absorb UV radiation & prevents it from hitting to the earth's surface.

Causes of Ozone layer depletion

The ozone layer depletion is a major concern & associated with a no. of factors. Some cause responsible for depletion of ozone by are given below:

1. Chlora fluorocarbons (CFC) are main cause of ozone layer depletion. These are released by the solvents airconditioners, Spray etc.
2. Unregulated Rocket Launches →Researches say that the unregulated launching of rockets result in more much depletion of ozone layer than CECS do If not controlled this might result in a huge loss of ozone layer by the year 2050.
3. Nitrogens compounds like N2O, NO2 NO are highly responsible for depletion.
4. Natural Causes → The ozone layer has been found to be depleted by certain natural processes. Such as spots & stratospheric winds But it does not cause more than 1-2% of the Late ozone layer depletion. Most of the volcanoes also responsible for depletion of ozone layer due to eruption of volcanos & flaming out of many pollutans, gases, CFCS etc .

The equilibrium between the formation & destruction. Of ozone has been upset by the influx of the several substances like CFC's, HCPC's. etc. Into the atmosphere which reacts with the ozone & destroys it. So, the rate at which ozone is being destroyed is far much more. Than the rate at which it is being produced. This results in the significant decrease in the concentration of Ozone in a particular region & hence Ozone holes are formed.

Keywords- ozone layer, cfc's, ultra violet, radiation, surface

P03: Antimicrobial Activity of Grape Vinegar with Selective Vegetables against Selected Food Borne Pathogens

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The popularity of fruits vinegar has increased recently as a healthy drink wealthy in bioactive compounds that provide several beneficial properties. Fruit vinegar is a popular natural product with multiple use purposes. Fruit vinegar contains several bioactive compounds such as organic acids, polyphenols, flavonoids, and alkaloids. These function molecules are playing an important role in the beneficial properties provided by fruits vinegar. Fruits vinegar contains several nutrients, these nutrients include aminoacids, sugars, vitamins, and minerals. The functions of these nutrients are to provide energy, regulation of cell metabolism, immunoregulation, antioxidation, anticoagulation, and improvement of brain development. Vinegar is also known for its strong antimicrobial properties against foodborne pathogens. These properties are mainly due to the content of acetic acid, which inhibits the growth of pathogenic foodborne organisms. The vinegar examined in this study differed, depending on the eatable's variety in terms of bioactive molecules and antimicrobial properties. Nowadays, products of natural origin with health-promoting properties are increasingly more common. Research shows that grape vinegar has many phytochemicals molecules which are helpful for the health, and antimicrobial properties against Escherichia coli (ATCC8739) and Bacillus subtilis, Staphylococcus aureus (ATCC 6539), Shigella flexneri (ATCC 12022), Salmonella typhi (ATCC 14028), Cronobactersakazakii (ATCC 29544), Vibrio parahaemolyticus (ATCC 17802), V. cholera (ATCC 3906) and Pseudomonas aeruginosa of grape vinegar conducted. This study shows the difference between different phytochemicals which are present in grape vinegar and different eatables. Anthraquinones are not present in grape vinegar but when some eatables are soaked with grape vinegar for 7 days its shows a positive result. White radish shows the highest antimicrobial activity against both *E.coli* and V, cholera but raw papaya has the highest antimicrobial activity against V, parahaemolyticus whereas White radish shows very little antimicrobial activity against V, parahaemolyticus.

Keywords: Antimicrobial activity, Grape vinegar, Fruit vinegar, Phytochemicals, Foodborne Pathogens.

P04: A Study on Aquatic Entomofauna Diversity and Composition in Bhosga Reservoir, Kalaburagi, Karnataka, India.

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The present study was designed to assess the diversity of aquatic insect fauna in Bhosga reservoir of Kalaburagi district. Dipping method was used to collect the aquatic insects from September 2020 to January 2021 during post-monsoon season. Identification of insects were done up to family level. The field survey was conducted using diversity indices. A total of 364 individuals were recorded which comprised of 6 orders and 14 families, the most abundant order was Hempitera (49%), followed by Diptera (19%), Odonata (13%), Coleoptera (11%), Ephemeroptera (5%) and Trichoptera (3%). Simpson's diversity index value was 0.692, Simpson's reciprocal index value was 3.247 and the Shannon-Wiener diversity index value was 1.429. Hence, values are found to be greater than 1 indicating good diversity of aquatic insect fauna in Bhosga reservoir.

Keywords: Aquatic insects, Bhosga reservoir, Composition, Diversity indices, Hemiptera.

P05: Development and Characterization of Starch-gelatin based Edible Films with Natural Compound and their Preservative Efficacy on Tomatoes

Kavitha D, Ramya R, Iswarya M and Madhumitha S, Karthiga S, Jothi Nayaki, S and Kavitha D.

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Food industry has been facing formidable challenges in-terms of sustainability and health implications due to packaging techniques. The study was focused to develop starch-gelatin based edible-films with the incorporation of antimicrobial-compound (isatin) for the prevention of post-harvest loss of tomatoes. Various parameters of prepared edible wrapper were evaluated and their preservative efficacy was analysed using food-model system. Developed edible-films have exhibited enhanced stability, solubility, transparency and antioxidant potential. Furthermore, spectral, morphological and mechanical characterization have revealed their utmost properties as alternative to existing packaging strategies.

Conclusively, developed edible-films have immense preservative quality on tomatoes and combat pathogenic attacks in foods.

Keywords: edible films, isatin, tomatoes, food model system, mechanical strength

P06: A Study on Physico-Chemical Parameters of Bhima River Kalaburagi, Karnataka, India

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The Bhima River flows through the Karnataka state, district of Kalaburagi, where water is 129ptimize for various purposes, so the objective of the current study is to assess the concentration of different water parameters in the Bhima River and analyze its appropriateness for drinking purpose. Between October 2021 to February 2022, samples were collected from eight separate sampling sites. The physicochemical parameters that were measured included pH, electrical conductivity, total dissolved solids, dissolved oxygen, total alkalinity, total hardness, chloride, sulfate, phosphate, and nitrate following standards methods. All of the sampling sites values for the variables like EC, and TH were above the BIS acceptable limits. On the majority of the parameters, it was shown that agricultural runoff and anthropogenic activities may have a negative impact on river water quality. River water quality deterioration is a major concern. For the sake of maintaining the aesthetic value of the river and promoting aquatic biodiversity, regular water quality monitoring in this area is essential.

Keywords-Physiochemical parameters, Electrical conductivity, and Total hardness

P07: Characterization of Bioconverted Flavonoids from Fruit Peel Wastes

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Organic waste, particularly fruit and vegetables, poses serious risks to human health and the environment. Bioconversion of these fruit wastes into value added renewable substrates for the production of bioactive compounds is considered to be a major significant phenomenon. Therefore the study was focused on the bioconversion of the flavonoids and the characterization of it. The structural modification and antioxidant potential of bioconverted flavonoids were investigated. The results of antioxidant analysis and FTIR analysis has concluded that the biotransformed flavonoids could be effective antioxidant to combat diseases related to oxidative stress.

Keywords- Bioconversion, FTIR, Flavonoids, Antioxidant, Oxidative stress

P08: Reconstructing Limnology of Karela Jheel, Lucknow, Uttar Pradesh using diatoms

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Water is an essential component of every living being on this globe. Most of the water is saline and only a little volume is available for the freshwater ecosystem. These freshwater exist mainly in the rivers, lakes, ponds, and Jheels. They are vital ecosystems of great economic, cultural, scientific, and educational values. Despite the small fraction of the earth surface occupied by lakes, they play an important role in climate system, and contributing to the global carbon cycle. The lack of reliable long-term data aims to provide the initial pristine conditions in water bodies and how they became polluted or disturbed in due course of time. Limnology in this respect is a vital approach to address the issue of the water quality management and future sustainability of our freshwater ecosystems. In recent years most studies focused on developing tools for accessing environmental changes of aquatic ecosystem. Diatoms have been widely applied for this purpose and used in bio-monitoring studies. They are unicellular microalgae occurring as solitary cells or in colonies, universally dispersed in all types of aquatic environment ranging 2 to 200 micrometers in size. Diatoms have siliceous (hydrated silicon dioxide) cell wall termed 130ptimize130 made of two intricately sculptured valves (epitheca and hypotheca) and inhabit marine and freshwaters and occur as planktonic (centric) and benthic (130ptimiz) in nature and allow reconstruction of water-level fluctuations. The Karela Jheel, Lucknow is a region where the diatoms led to discriminate the lake level changes. A sediment core of 28 cm (subsampled at 1cm) was raised from the Karela Jheel for the diatom study. The fluctuations in composition, numerical abundance and diversity pattern of the diatom assemblages have been studied to infer limnological changes. Three different zones of the diatoms are inferred from the core. Zone I (23–28 cm) shows dominance of centric forms over the 130ptimiz diatoms but with low frequencies. This can be attributed to fluvial control and river connectivity during initial phase of deposition. Zone II (9-22 cm) the high centric diatoms over the pennates suggest high lake levels than present also indicating the continuous of channel flow during the deposition time. This may represent period of initial setup of ox-bow lake (Jheel). Zone III (0-8 cm) is marked by pronounced 130ptimiz diatoms over centric ones with very low C:p ratio, and suggest very low water level in the Jheel. High diversity of 131ptimiz diatoms indicates

further shallowing of the Jheel probably due to anthropogenic activities in the region. The present study from the Karela Jheel provides evidence to changing scenario of the landscape and limnological changes in the Ganga Plain where the geomorphic processes are very relevant for understanding the fluvial processes in a broad perspective to cope with the futuristic scenario of water level changes and fluctuations.

Keywords-Limnology, water quality, aquatic ecosystem, diatoms, Karela Jheel, biomonitoring

P09: Ultra Violet (UV) Radiation Levels were Alarmingly High in the Monsoon Months in Chittorgarh District, South Rajasthan

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The study was conducted between April 15 and August 28, 2022. Sampling was done every week. It is first of its kind to be conducted in Chittorgarh. The survey was conducted with the help of three different digital instruments, between 8 am to 6 pm. Care is taken that the reading is taken by keeping the UV sensor and light sensor towards the sun. The study 131ptimiz on the increasing burning effect of sun rays despite the almost similar temperature patterns. It was carried out in an area of 3,874 square kilometers of Chittorgarh district and collected data from 184 locations.

The results of the survey were alarming as it shows extremely high levels of intensity of UV radiations which is very harmful for human beings and other creatures as well. Highest UV index 12 was found in the 4 tehsils (Chittorgarh, Kapasan, Nimbahera, Rashmi). The maximum UV index in remaining tehsils was 11.

As per the data collected, UV radiation levels were in the high risk range in the warmer months (March, April, May, July, August). Ultra violet (UV) radiation levels were alarmingly high in the monsoon months, an analysis of the recordings in the district from April till September of this year.

Keywords: Ultra violet (UV) radiation, district, UV index, ozone.

P10: Water Quality Estimation In Berach River, Chittorgarh, South Rajasthan With Special Reference To Primary Productivity

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Primary production studies are of paramount interest in understanding the effect of pollution on a system's efficiency. High rates of production both in natural and cultural ecosystems occur when Physico-chemical factors are favorable. Water pollution is a major problem in all the important rivers of India. Due to increasing urbanization and industrialization, the pollution potentials of rivers are gaining momentum day by day, which leads to a reduction in primary productivity. The historical city of Chittorgarh has two perennial rivers: Gambhiri and Berach. Among these two, the Berach river is one of the ancient freshwater rivers of length 157km and basin area of 7502sq. km. In this present investigation several biological communities and aquatic macrophytes have been considered apart from the various 132ptimichemical factors viz. Water pH, temperature, dissolved oxygen, biological oxygen demand, alkalinity, nitrate, phosphate and total dissolved solids assessment of water quality in Berach river at Chanderia, Chittorgarh from September 2020 to July 2021 for a 12 months period. The study indicated that Primary productivity of the river was high (GPP 1.69 to 6.86 gC/m3/day and NPP 0.81 to 5.01 gC/m3/day), which indicates that the river falls in eutrophic category. This productivity was also supported by phosphate (0.18 to 2.6 mg/l), nitrate (13.2 to 25.8 mg/l).

Keywords-Physico-chemical, Berach river, GPP, NPP, eutrophication.

P11: Green Synthesis of Zno Nanoparticle Using Alangium Salvifolium and Its Potential Antibacterial and Anticancer Activity

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Green synthesis of nanoparticles is becoming increasingly important due to their low cost, high productivity, purity, biocompatibility, and environmental friendliness. In this study alangium salvifolium, flower aqueous extract was used as a reducing and stabilizing agent to synthesize zinc oxide nanoparticles (ZnO NPs). The synthesis of nanoparticles was confirmed by advanced instrumentation such as UV-visible spectroscopy, Dynamic light scattering (DLS), Fourier transform infrared spectroscopy (FTIR), X-ray diffraction (XRD), and Field emission scanning electron microscopy (FE-SEM). Antibacterial activity of the nanoparticle was performed against the different gram-negative and positive bacteria whereas anticancer activity was performed against the cancer breast cell line. The result of the study found that synthesized ZnO nanoparticles gave significant antibacterial against the *E,coli*, B.subtillus, pseudomonas, and S.aureus at different concentrations. Furthermore, synthesized nanoparticles also showed anticancer activity against the breast cancer cell line. This study reveals that the synthesized ZnO nanoparticle using alangium salvifolium has potential antibacterial and anticancer activity. keywords- Eco-Friendly, Nanoparticle, Synthesis and Characterization, Advance Instrumentation

P12: Assessing the Severe Eutrophication Status and Water quality index for River Shilabati, West Bengal, India

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Water is an important asset for every country especially the river water which is the prime source for all domestic and drinking usage. The evaluation of river water quality highly depends on the Eutrophication index (EI) and Water Quality Index (WQI), which is the representative of the health of the aquatic ecosystem. The study was carried out to determine the Shilabati River, West Midnapore, West Bengal, India, water quality based on the physicochemical and biological parameters. Water samples were collected from eighteen stations along the river and analyzed using standard methods. The results indicated that most of the physicochemical parameters of the river were within or at periphery in comparison with permissible limit of ISI and WHO for drinking water. The Eutrophication index (EI) also reveals the eutrophic nature of the river which can be accounted due the high phosphate loads. The results have clearly indicated that this lake is polluted and eutrophic in nature due to discharge of sewage and other anthropogenic activities. Overall it can be concluded that the river is highly polluted and it requires proper management strategies

Keywords-River pollution; Eutrophication index (EI); Water Quality Index (WQI); Water Quality

P13: Photocatalytic Degradation of Caffeine (emerging contaminant) using Cu-ZrO_2/GO Hybrid Composite

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Naturalwater bodies are continuously getting contaminated due to increased discharge of emerging contaminants (EC). Caffeine is one of the hydrophilic Ecs, whose concentration is continuously rising in natural water due to increased consumption of tea, coffee, beverages, energy drinks, and is therefore called as anthropogenic marker. Thus, it is important to give urgent attention to its removal from water bodies. One of best ways to do this is using photocatalysis. Here we present a visible light active Cu-ZrO_2/GO photocatalyst for degradation of caffeine along with its characterization. Cu-ZrO_2/GO could degrade 78% caffeine from real samples.

Keywords: Photocatalysis, emerging contaminants, caffeine, degradation, hybrid composite

P14: Removal of Heavy Metal Using Aquatic Macrophytes Salvinia

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Both wealthy and emerging nations are concerned about environmental contamination, particularly water pollution. Water resource heavy metal contamination is a serious problem that harms people, plants, and animals. A remediation technique that is efficient and capable of treating heavy metal-polluted environments is phytoremediation. Most notably high growth rate plants, or macrophytes, numerous aquatic plant species are currently being researched to identify their potential and usefulness for phytoremediation application. Different affinities for the incorporation of the metals in its biomass were found in the Salvinia sp. Plant.Both wealthy and emerging nations are concerned about environmental contamination, particularly water pollution. Water resource heavy metal contamination is a serious problem that harms people, plants, and animals. A remediation technique that is efficient and capable of treating heavy metal-polluted environments is phytoremediation. Most notably high growth rate plants, or macrophytes, numerous aquatic plant species are currently being researched to identify their potential and usefulness for phytoremediation application. Different affinities for the incorporation of the metals in its biomass were found in the Salvinia sp. Plant.

Keywords: Environmental contamination, Phytoremidiation, Salvinia

P15: Study on the Physico-chemical Parameters of Futala Lake and Ambazari Lake at Nagpur City

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The aim of this study was to analyze 135ptimi-chemical characteristics of two water bodies of Futala lake and Ambazari lake at Nagpur City, Maharashtra. Various 135ptimi-chemical parameters of water such as colour, odour, taste, temperature, turbidity, pH, electrical conductivity, total suspended solid, DO, BOD, COD, alkalinity, hardness, chloride, sulphate were analysed. The experimental values of both water samples were compared with standard values given by WHO. The result revealed that there was significant variation in 135ptimichemical parameters of both lakes and water in this area is not suitable for drinking as well as other domestic purposes. Water pollution is the release of substances into water bodies which makes water unsafe for human use and disrupts aquatic ecosystems.

Keywords: Physico-chemical parameters, Lakes, DO, COD, Water quality, Alkalinity.

P16: Identification of Uranium in Groundwater Sample in and Around Avathi, Devanalli Taluk, Bengaluru Rural District

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Uranium is a naturally occurring radioactive chemical element that occurs in low concentrations in nature. It is present in certain types of soils and rocks, especially granites. Studies have revealed that presence of Uranium in drinking water causes Nephritis (kidney damage). Chemical effect rather than of its radiological property of being radioactive elements in the nature. A total 4 samples were collected in the place of Avathi rural Devanahalli Taluk during in the month of January -2022 to July-2022. A small trace amount of Uranium was identified during the analysis. This work reveals that, the presence of Uranium is found to be harmful to the human health of Devanalli Taluk, Bengaluru. The aim of this work was to identify the trace amount of Uranium in the study area and take to create awareness to the general public of the the rural Avathi to take precautionary measurements from the Uranium exposure.

Keywords: Uranium, Devanahalli Taluk, Radioactive elements.

P17: A Report on the Thermal Stress and Disease Outbreaks in Corals: Hexacorallia And Octocorallia.

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Hard and Soft corals under the subclass Hexacorallia and Octocorallia, respectively, in phylum Cnidaria, are a group of marine invertebrates widespread and can be found in shallow and deep waters. The primary risk on corals includes the natural effects of temperatureinduced bleaching and anthropogenic impact. The Indo-Pacific region appears to experience high water temperatures during El-Nino events, which coincide with coral bleaching. The hard corals of genera like Acropora, Pocillopora, Montipora, Favia, Favites, Turbinaria, and Poritesare prone to bleaching. Colonies of the octocoral genera, likeLobophyton, Sinularia and Sarcophyton, also showed bleaching. Tissue-wasting-like symptoms, tissue mortality, and eventual death were also reported from other reef systems. The resilience of the coral colonies is increased in several genera, like Acropora, with increased temperature and in some groups, like Porites, reported rigidity. White syndrome, Yellow band disease, Black band disease and Growth anomalies, which are directly linked to the ambient temperature, are reported from Lakshadweep coral reefs. Red band disease, Black necrotic syndrome, and Aspergillosis affect soft corals and are not reported from Indian waters, denoting the good health status of the octocorals of Lakshadweep. We observed temperature and coral bleaching in the reefs of the Lakshadweep archipelago and obtained a positive correlation between bleaching and prolonged exposure to the temperature during the summer months.

Keywords: Coral reef, Coral Disease, Thermal anomalies, Bleaching, Lakshadweep.

P18: Automatic Wireless Power Transfer Technology for Electrical Vehicle

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Electrical vehicles are a recent trend in electrical world. Evs help to reduce fossil fuel consumption and hence preventing emission of Green House Gases. The development of Electrical vehicles, electrical hybrid vehicles are in high demand due to their increased benefits and they are ecofriendly. The main barrier to this development are high price, weight, volume, driving distance, and limited investment in charging infrastructure. Electric vehicles, traveling range and charging process are the two major issues affecting its adoption over conventional vehicles. With the introduction of Wire charging technology, no more waiting at charging stations for hours, now get your vehicle charged by just parking it on parking spot or by parking at your garage or even while driving you can charge your electric vehicle. As of now, we are very much familiar with wireless transmission of data, audio and video signals so why can't we transfer power over the Air. Thanks to great scientist Nikola Tesla for his limitless amazing inventions in which wireless power transfer is one of them. Shaped magnetic field in resonance (SMFIR) technology enables electric vehicles to overcome these limitations by transferring electricity wirelessly from the road surface while vehicle is in motion. This work describes the innovative SMFIR technology used in the Korean Advanced Institute of Science & Technology online electric vehicle and wireless electrical vehicle charging lane in UK. Electric power transmission is the bulk movement of electrical energy from a generating site, such as a power plant, to an electrical substation. The interconnected lines which facilitate this movement are known as a transmission network.

Keywords- Electric Vehicle, Wireless charging Transportation, SMFIR, Battery, WPT, Eco friendly

P19: Studies on Herbage Dynamics in the grassland Vegetation of Khongjom, Thoubal District, Manipur, North East India.

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The present study deals with the herbage dynamics in grassland vegetation of Khongjom, Manipur on various aspects in different months as changes in aboveground live biomass, relationship among abiotic and biotic variable in the grassland ecosystem. The live biomass,g rowth pattern, contribution of individual species, standing dead, litter, belowground plant biomass, reached its peak in September (864.89 gm^{-2}) and minimum in January (22.074 gm^{-2}). The standing dead material peaked in November (86.14 gm^{-2}) and minimum in February (321.23 gm^{-2}) whereas litter recorded maximum in December (205.56 gm^{-2}), minimum in August (78.46gm^{2+}). Thus, there is an urgent need to promote forage production for livestocks in Northeast.

Keywords- Livestock, grassland, Biomass, ecosystem, Northeast.

P20: A Case Study – Climate Change & Reduction of Air Pollution in Kolkata as Observed During Lockdown

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As Kolkata is adjacent to Hooghly river & nearby to the Bay of Bengal (100km approx.), so it is expected to be moderately hot during the summers. But last few years Kolkata have witnessed extreme heat (Temperature gone upto 42 degree celcius). The reason being tremendous increase in anthropogenic activity, mainly vehicular emissions (PM,CO,CO2) along with fossil fuel burning. However, this year-2020, the summer months (April to till date within lockdown period) are not so hot(Temperature is moving around 35 degree celcius) as compared to last year. Frequent rainfall and evening breeze has been observed which is very true nature of a place which is geographically close to the sea. These observations show that the disturbed ecology of Kolkata can be restored if vehicular emissions are lowered. It can again turn to a wonderful place as it was few decades ago. Restoration of the ecology will help to increase productivity in all the sectors. Migratory bird in large no with other creature has been prominently noticed within Kolkata & India at large. This will also make people healthy as breathing clean air will purify the lungs and we will be able to combat pandemics like corona and many more. This paper aims to bring some simple but vital information which will help to understand the actual problems of pollution and bring out solution for healthy environment with the help of statistics (research approach & methodology).

Keywords: Environment during lock down within Kolkata

P21: Monitoring of Woolly Apple Aphid (Eriosoma Lanigerum (Hausmann)) Through Eco-Friendlytrap in Apple Orchard – A Preliminary Study

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Apple (Malus × domesticaBorkhhausen, Rosales: Rosaceae) is a significant fruit crop in temperate areas and it is the third most widely produced fruit all over the world. In India, Jammu & Kashmir, Himachal Pradesh and Uttarakhand are the major apple-producing states, which constitute about 99.62% of apple production in 2021-22. About 2.44milliontonnes of apple fruit is produced in India by these states including Arunachal Pradesh, Nagaland and Telangana in 2021-2022. Apple fruit crop is attacked by various insect pests. Eriosoma lanigerum is one of them and it is a serious quarantine pest of apple. They form densely packed colonies covered with white waxy filaments. The woolly apple aphid nymphs and adultscan feed simultaneously on the edaphic and aerial sections of the apple tree. The feeding by edaphic colonies of woolly apple aphids induces the formation of root galls which interfere with the conduction of water and nutrients. This causes areduction in the growth of apple trees. The aerial colonies of this pest destroy the developing buds in leaf axils and thus reduce the tree's vigor. The first-instar nymphs of this pest, known as crawlers, migrate from the edaphic populations up the tree trunk in the spring to develop aerial colonies and in the fall they move to the edaphic portion of the apple tree to form edaphic colonies. The aim of this field study was to monitor the migration of woolly apple aphids during autumn. For this, eco-friendly jute hessian cloth trap of dimensions10 cm × 0.8 cm is tied to apple stems. This trap was soaked in linseed oil containing chlorpyriphos (2 ml/l) before tying on apple stems. The trap was assessed at an interval of 10 days to count the entangled number of nymphs, adults or any other beneficial insects. Further this study evaluated the effectiveness of a jute hessian cloth trap in obstructing and killing WAA during the autumn. The present study is a preliminary one and further research is needed to evaluate this trap.

P22: Biotreatment of Sewage Water Using Bacillus Aryabhattai S9-TSA-17 and Aeromonas Caviae SS332 via Pure and Mixed Culture Method

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In the present study, autochthonous bioremediating bacteria were isolated from sewage water and then evaluated for protease producing capacity and antimicrobial activity. These bacteria were identified as Bacillus aryabhattai S9-TSA-17 and Aeromonas caviae SS332 using biochemical characterizations and 16S rDNA molecular analysis. These bacteria were further evaluated for their percent degradation potential individually and in consortium in which consortium of the bacteria was found to have high pollutant removal efficiency rather than the pure culture. These bacteria can be further used at commercial level to decontaminate the sewage water before being discharged or used for agricultural purposes.

Keywords- Aeromonas caviae; Autochthonous; Bacillus aryabhattai; Biotreatment; Sewage water

P23: Phytase: A Way to Reduce Environmental Pollution

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Phytase are enzyme capable of hydrolyzing phytic acid to myo-inositol and inorganic phosphorus. Phytic acid is the major storage form of phosphorus and inositol in plant seeds, that comprise a major part of animal feed. Phytase are mainly used as animal feed additive as they enhance the nutritional quality of feed and thus can help in combating pollution occur by release of undigested phosphorus in the environment. The microbial phytase are most promising for reducingsuch environmental pollution.

P24: Antibacterial Screening and Chemical Characterization of Bio Active Compound from Wheat Grass

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In in the recent years, research on drug development is increasingly focusing on herbal or alternative medicine. Wheat Grass (Triticum aestivum L.) is a member of Poaceae family, and is known to be a nutritional powerhouse. The present study deals with the comparative study of antibacterial screening of Sharbati and Lokman varieties of fresh wheat grass juice with Sharbati wheat having the best zone of inhibition indicating its high antibacterial potential. Further in the GC-MS analysis among all the selected solvents, methanol was found to be good solvent extract which showed the positive result for the chemical characterization of a number of bioactive compounds. Beta amyrin is a bioactive compound found in the GC-MS result is widely known to act as an ideal anti-inflammatory and antifibrogenic agent, also exhibiting the significant anti-cancerous activity.

Keywords- antibacterial amyrin Wheat

P25: A Review Article: Environmental Effect of Emissions by Thermal Power Plants in India.

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The principal emissions by coal combustion at thermal power plants are carbon dioxide (CO_2), nitrogen oxides (Nox), sulphur oxides (Sox), chlorofluorocarbons (CFCs), and aerial inorganic particles such as fly ash and soot. The emissions considered to be partly responsible for damaging global climate change are greenhouse gases (CO_2, methane, and CFCs). This review encapsulates the position of thermal power plants in India and their several type of emissions that produce harmful causes and consequences over the environment and human health. In addition, it highlights various type of preventive measures used to avoid/reduce emissions.

Keyword-Thermal Power Plants, Environment, Emissions by Coal Combustion, Preventive Measures.

P26: Isolation and Screening of Plant Growth Promoting-Biosurfactant and Ligninolytic Producing Bacteria for Bioremediation of Distillery Wastewater

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About 12-15 L of aqueous waste is generated during alcohol distillation popularly known as distillery wastewater. Dark brown color DWW is acidic and contains high amounts of biological oxygen demand (BOD) chemical oxygen demand (COD), total dissolved solids (TDS), heavy metals (HMs) with endocrine disruptive chemicals (EDCs), etc. Due to the high load of pollutants DWW cause hazardous and toxic effects on the environment and human health. So treatment of DWW is mandatory before discharge into the environment. In the current research work, we have isolated 11 isolates from the rhizospheric zone of Lesser Bulrush (Typha angustifolia) grown in a distillery waste dumping site. All Isolates were screened for plant growth promoting 142ptimize142ion142142 and ligninolytic producing properties and selected TR7 as the most potential isolate. Further, TR7 happy for DWW treatment and found that color, total nitrogen, BOD, COD, iron, zinc, copper, lead, cadmium, chromium reduction were 53.95%, 51.57%, 68.13%, 83.46%, 87.54%, 78.84%, 76.33%, 84.56%, 41.02%, 65.82%, respectively after bacterial treatment. So, it's indicated that TR7 could be a potential, suitable and sustainable option for bioremediation of distillery and other industrial wastewater.

Keywords- Plant growth promotion, Distillery wastewater, Biosurfactant, Ligninolytic, Bioremediation

P27: Comparative Study of the Remoulded Coral Ecosystem and Psychosomatic Morbidity among Andamanese People Due to Tsunami

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Natural disasters such as tsunamis can have a devastating impact on the psychological andsocial well-being of anyone exposed to them. Within the coastal ecosystem, coral reefs and were also severely affected. Great Nicobar accounted for a higher proportion of the total forest area damaged and submerged in Nicobar, followed by Central Nicobar and Car Nicobar. Mangroves, littoral forests, beach forests and low land swamps and Syzygiumswamps were most affected. While the rise in sea surface temperature caused massive coral bleaching resulting in the separation of symbiotical gae from host corals which play a key role in supplying 143ptimize143io food. The reduced live coral percentage after the tsunami waswitnessed in three islands such as Jolly buoy, Tarmugli and Havelock. The damage due to thesubduction of reef areas in south Andaman and north Andaman had created a long-term effecton changes in depth levels, soil erosion, change in tide, wave aptitude, overall dynamics, andhydrographic properties. Spawning ground needed for their species' survival also gotdevastated resulting in the desolation of marine diversity. The consequences vary from loss oflivelihood for fishermen to unknown damages to coral reefs and flora and fauna where thewaves came a few miles inland. In some fragile areas near the Indonesian coast, it may takeyears for the coral reefs to get back the balance and mangrove stands and coastal treeplantations may have been destroyed. With so much seawater coming inland, salination isanother problem that makes the soil less fertile and a constant change in the pH of soil causesthe loss of vegetation. And like a domino effect many fish, turtles and other creatures especially seacows would disappear. Disasters threatened personal safety, overwhelm defence mechanisms, and disrupt community and family structures. Such events may alsocause mass casualties and destruction of property and may lead to a collapse of the socialnetworks and daily routines of the individuals affected. Children and adolescents are more vulnerable than adults to the traumatic events of disasters. Even in pre-schoolers, the effects can be serious and persistent and can influence their

personality development, but, at the same time, children have the plasticity to change if an intervention can be developed toaddress their coping skills. The most common psychiatric morbidities observed among theprimary and secondary survivors are adjustment disorder, posttraumatic stress disorder, subclinical syndrome, and schizophrenia. Disasters are events that invite a public healthapproach to mental health that better serves the needs of the individual and the affectedcommunity. Such an approach considers all available human resources and is intended tomitigatetheeffects of disasterbeforeserious psychopathologic sequelae arise.

Keywords-Tsunami, coral bleaching, ecosystem, psychosomatic disorders

P28: Phylogenetic profile of the ascidian Lissoclinum sp. From Lakshadweep islands, India

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The biodiversity of tunicates in Lakshadweep waters was studied. Modified CTAB method for DNA extraction, amplification of mitochondrial COI gene and sequence analysis was used for phylogenetic variability analysis of Lissoclinum sp. Sampled from Kavaratti Island, Lakshadweep. Results indicated that Lissoclinum sp. Is endemic to Lakshadweep waters. The species shows 85.68, 86.64, 86.62, 86.67 and 83.97% similarity with Lissoclinum fragile. They are related to Lissoclinum sp. Collected from West Plana Cay Reef in Bahamas (599, 528, 569 and 606bp) and Palk Bay region in India (461bp). The present study contributes the first report of ascidians from Lakshadweep Archipelago.

Keywords: Ascidian; Lissoclinum; COI gene; DNA barcoding; molecular phylogeny

P29: Physico-chemical Characterization of Surrounding Soil of PTPP using BET, XRD, SEM, EDS and to Find its Suitability in Agriculture by Evaluating the Growth Rate of Glycine max.

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Thermal power plants assumed celestial dimensions by producing an immense quantity of fly ash. Its management is still a significant problem. Its dry disposal practice is affecting nearby air, water, and soil. In the present study, an attempt has been made towards the soil near Parichha thermal power plant (PTPP) for natural plant growth, which found to contact disposed of fly ash, a solid waste. These soil samples have been used for natural plant growth of Glycine max by using pot culture (without any fertilizers) to understand the impact of fly ash deposition on the surrounding soil. For its quality measurement, we used some Physicochemical parameters with spectroscopic techniques. SEM-EDS were applied for the morphological study; BET was used for pore size, surface area, and pore volume analysis. FTIR and XRD are used for a functional group, and elemental phase forms availability. The Glycine max growth rate analysis suggests the maximum growth was observed in soil collected from 2 km away PTPP. Studies also suggest that for superinducing the crop productivity of problematic soil, coal-burning fly ash can use because it has some beneficial and abundant elements for better plant growth.

Keywords-Fly ash, soil, growth rate, BET, SEM-EDS, Xrd, etc.

P30: Diversity and Abundance of Sea Cucumbers in Kavaratti Atoll, Lakshadweep Archipelago

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Sea cucumbers (Echinodermata: Holothuroidea) are regarded as an important part of Lakshadweep atoll's marine heritage due to their diversity and Ecological value. The present study was conducted with the aim of documenting the species composition and diversity of sea cucumber population in Kavaratti atoll of Lakshadweep archipelago. Several ecological studies have been conducted aimed at documenting the distribution of sea cucumbers in these area. At present it is estimated that more than 36 species of sea cucumber are present in

Lakshadweep archipelago. The study was conducted from October to December 2020 with 43 belt transects from intertidal zones, lagoon, outer reef flat, and outer reef slope to a depth of 30m. Twenty-one species are presently recognized, two species of the Genus Bohadschiaspare new records for the island. The family Holothuridae, which includes the largest and most diverse taxa in this atoll, comprise of 14 species. Nevertheless, a large number of undetermined species have been recorded, thus requiring further research to update the species identification. The information and observations in this study will be of use in formulating management policies for the sea cucumber conservation in the Lakshadweep archipelago.

Keywords: Holothuria, Kavaratti, Lakshadweep, Atoll.

P31: Monitoring of Fly Ash Disposal by Power Plant using Landsat Satellite Image using Support Vector Machine classifier.

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Fly ash is one of the hazardous pollutants which are disposed of by thermal power plants which can be monitored very easily by the use of analysis of satellite data, and systematic results can be produced in less time. The aim of this paper is to study the fly ash disposed area by using Support Vector Machine classifier on Landsat image of Koradi Thermal Power Station, Nagpur, Maharashtra State. It is observed that polluted areas during the year 2001, 2010 & 2022 were 1.89 hectares, 1.53 hectares and 3.6 hectares respectively. Hence SVM clearly classified the polluted area accurately.

Keywords: Fly ash; Support vector machine classifier (SVM) & supervised classification.

P32: New Gravity Theory of Physics and Miscellaneous

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Newton told that Earth held the atmosphere but Earth not held the atmosphere. According to "New Gravity Theory of Physics and Miscellaneous" neither Earth held the atmosphere, nor atmosphere held the Earth. Instead the Earth itself entangled in atmosphere because the way it was formed. Gravity of Earth and all planets gravity is the main finding in this theory. Nuclear fission reaction in the stars is also the main finding in this theory.

Keywords: Earth, planets, Sun, nuclear reaction, force, atmospheric force, torque, gravity, gravitational force.

P33: Exploration of Mycoremediation Potency of Spent Mushroom Substrates of Pleurotus Florida for Iron Heavy Metal

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The ability of Pleurotus ostreatus spent mushroom substrate for the mycoremediation potency was investigated against some heavy metals, i.e., Iron, Copper, Manganese, Lead, and Nickle, from aqueous solutions. The effects of treatment parameters of the spent mushroom substrate with heavy metal (Fe) were analyzed and recorded, such as pH, initial concentration of heavy metal, and incubation time. This parameter drastically affects the biosorption process of the spent mushroom substrate. Thus, the physiological evaluation also interpreted the purity of treated water in contrast to Fe-contaminated water. These results suggested that SMS will be potentially and successfully valid for treating contaminated water by developing costeffective tools and portable devices for every societal stage.

Keywords- Mycoremediation, Spent mushroom substrate, Heavy metal, Cost-effective tools, Contaminated water.

P34: Impacts of Climate Change on Underprivileged Women in Ayodhya and Jaipur, as well as the Need for Action to Ensure India's Sustainable Development

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Women are more vulnerable to climate change than men, and as a result, they suffer the most. Because data collectors gather information from household heads, mostly men, these women are left out of the data collection process. According to the SDG report 2022, this is one of the major issues we are dealing with. We chose the Indian cities of Jaipur and Ayodhya for the study, and we interviewed women from disadvantaged families, including those below the poverty line. This paper discusses the effects of climate change on women's lifestyles, trends in disease transmission, trends in natural disasters, food consumption, women's daily work patterns, changes in traditional knowledge, and why it is crucial to take action for India's sustainable development.

Keywords- Climate change, Sustainable development goals, Women, Jaipur, Ayodhya, Labour, food security

P35: Mangrove Pollution and Environmental Risk Assessment in the Westsouthern part of Gujarat

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Mangrove forest serves as an interface between land and sea. This unique ecosystem performs several functions such as inundation control, protection from erosion, storm, flood, and tidal damage, and generating goods and products such as fish, crabs, and forest resources. These functions are of fundamental importance to society. Toxic metal pollution in the coastal ecosystem is becoming a serious problem, particularly in developing countries. The present study aims to identify the challenges of the mangrove wetlands and the toxic metal content and pollution status in the habitat in West-southern part of Gujarat, also their uses and socio-economic influence on local people, and the value of ecosystem services and to suggest the way forward for conservation. And also the status of mangrove health in the west southern part of Gujarat. Results indicate that some sites have high- efficiency in the bioconcentration factor and also habitat for toxic metals such as Cr, Cu, Zn, Sr, Ni, Mn, and Ti.

Keywords- Mangroves, Ecosystem, Toxic metals, Bio-concentration

P36: Evaluation of Metal Contamination of Bhima River Sediment In Kalaburagi, Karnartaka, India

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The Bhima River, a significant tributary of the Krishna River, is considered to be rapidly polluting due to the large number of pollutants poured into it each year, negatively impacting its geohydrologic status. In order to know the present sediment pollution status, surface sediments samples from eight locations were collected using grab sampler and examined for heavy metal concentration (Zn, Cu, Mn, Cr, Al, Fe, Mg, Cd and Pb) during the period September 2020 to February 2021. Metals were detected using atomic absorption spectrophotometry. The obtained results were in the following order Al> Fe > Mn > Mg > Cu > Zn > Cr > Pb > Cd. To assess the amount of pollution status, the geo-accumulation index (Igeo) and enrichment factor (EF) were used to measure sediment contamination. In sediments, the EF values for Cu, Mn, and Cd were greater than 10, indicating a significant level of contamination by these metals. These EF demonstrated that Cd was present in almost all sampling sites. Cu had the greatest Igeo values at one location while Cd had the highest Igeo values at practically in all sites. The evidence points to an anthropogenic effect on the river's metal levels. Cu, Mn, and Cd concentrations are expected to have a negative impact on sediment.

Keywords: Bhima River, Enrichment factor, Geoaccumulation index, Heavy metal, Sediment.

P37: Exploitation of Amorphophallus Paeonifolicus (Elephant foot yam) Food waste, for the Development of Bioplastics

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Pollution is one of the serious problems faced by human and other living organism on our earth. Plastics are non degradable and not disposed in proper way. Bioplastics is a biodegradable material and alternative way which replaces the usage of plastics. Based upon this an attempt has been made to synthesize biodegradable plastics from Amorphophallus paeonifolicus (Elephant foot yam) and comparing the bioplastics produced by two different methods as (Sample A and B) and analysed. Further 149ptimize149ion149149149n test by swelling test and solubility test which ensure the quality of the bioplastics for Sample A.

Keywords: Bioplastics, Food Waste, Amorphophallus paeonifolicus, pollution, and starch based bioplastics

P38: Effect of Aluminium ion Doping on A-site in Nano Structured Spinel Nickel Ferrite using sol-gel Method

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Nanocrystalline Al doped nickel ferrite [$Ni_{1-x}Al_xFe_2O_4$ (x= 0, 0.5)] powders have been synthesized by using sol-gel method and the effect of aluminium content on the structural, electrical, dielectric properties has been studied. The X-ray diffraction (XRD) revealed that the powders obtained single phase with spinel structure. The X-ray diffraction (XRD) revealed that the powders obtained single phase with spinel structure. The lattice constant, interplanar distance and crystallite size decrease with increasing the doping of Al content. FTIR analysis of Ni-Al ferrite revealed that two main absorption bands of metal oxygen (FeO) stretching vibration observed at 424 and 601 cm^{-1} in the Nickel ferrite pure sample which corresponded to the stretching vibration frequency of the metal –oxygen at the octahedral site and tetrahedral site respectively and in the Al doped (x= 0.5) sample, two vibrational modes have appeared at 454.01$cm^{-1}$and 619.3cm^{-1}. First mode was attributed to the stretching vibrations of tetrahedrally coordinated (Fe^{3+}-O^{2-}) bonds and second mode was attributed to the metal oxygen vibrations in the octahedral sites. In the both sample the bands near to at (3327-3390) cm^{-1}can be assigned to O-H stretching vibration interacting through H bonds that originate from moisture content in the sample. In Raman analysis, there are five active bands present in the nickel ferrite and aluminium doped nickel ferrite. Raman peaks over the region of 620-720 cm^{-1}represent the modes of tetrahedral group (T-site) and those in the 450620 cm^{-1}region correspond to the modes of octahedral group (O-site) of ferrites. Dielectric 149ptimize ofsample showed that the value of dielectric constant (ε′) and dielectric loss decreases with frequency and confirmed the general behavior of ferrites. The σ_{ac} (ac conductivity) decreased as the Al content increasedin the samples. Are commonly employed.

P39: Development of Herbal Antimicrobial and Biodegradable Sanitary Napkin

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Menstruation is a natural part of female reproductive cycle from the age of menarche to menopause. The present paper explores the major issues of menstruation hygiene in females and biodegradation of these sanitary pad in environment and their solution. In rural areas and in low- and middle-income family's accesses to sanitary pads is limited and females use unhygienic material like unsensitized cloth, husk, mattress stuffing which may cause chronic reproductive tract infection. In urban areas female used plastic based chemically treated pad like, dioxin, which blocks dampness and heat, encourages fungal and bacterial growth, can leads to cervical cancer. These pads are also major threat to the environment as they are non- biodegradable in nature. Considering these issues, we have taken up this study to provide cost effective, ecofriendly, pad with antimicrobial properties. To reduce the product cost the top and bottom sheet was developed by cotton non-woven fabric "Cotton Fusing" to keep the top sheet dry, highly absorbent and very low in cost. Next is green protective sheet of cotton fusing treated with natural herbal extract of Cassia fistula and Cymbopogon nardus, which has antimicrobial and antifungal efficacy against E. coli and Candida albicans fungus, a leading cause of infections and diseases, avoid odor problem of pad, with balanced pH. The core layer is a naturally available absorbent cotton treated with herb extract. Biodegradable polyethene was used as barrier layers. Comfort related features of product were assessed through grading done by students, females, showed satisfactory result. Biodegradation process of pad was done. This research therefore evaluated the feasibility of developing sanitary napkin by antifungal and antibacterial property, highly absorbent, biodegradable, low cost, balance pH and no odor. Such an innovation would lead to the development of best menstrual hygiene performance and save our mother earth. PATENT NO-201711046970

Keywords: Sanitary Napkin, Cotton Fusing Sheet, Antifungal, Antibacterial, Herbal, Cassia fistula, Cymbopogon nardus, Ecofriendly, Biopolythene, Biodegradation

P40: Automatic Wireless Power Transfer Technology for Electric Vehicle

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Electrical vehicles are a recent trend in electrical world. Evs help to reduce fossil fuel consumption and hence preventing emission of Green House Gases. The development of Electrical vehicles, electrical hybrid vehicles are in high demand due to their increased benefits and they are ecofriendly. The main barrier to this development are high price, weight, volume, driving distance, and limited investment in charging infrastructure.

Electric vehicles, traveling range and charging process are the two major issues affecting its adoption over conventional vehicles. With the introduction of Wire charging technology, no more waiting at charging stations for hours, now get your vehicle charged by just parking it on parking spot or by parking at your garage or even while driving you can charge your electric vehicle. As of now, we are very much familiar with wireless transmission of data, audio and video signals so why can't we transfer power over the Air. Thanks to great scientist Nikola Tesla for his limitless amazing inventions in which wireless power transfer is one of them. Shaped magnetic field in resonance (SMFIR) technology enables electric vehicles to overcome these limitations by transferring electricity wirelessly from the road surface while vehicle is in motion. This work describes the innovative SMFIR technology used in the Korean Advanced Institute of Science & Technology online electric vehicle and wireless electrical vehicle charging lane in UK. Electric power transmission is the bulk movement of electrical energy from a generating site, such as a power plant, to an electrical substation. The interconnected lines which facilitate this movement are known as a transmission network.

Keywords: Electric Vehicle, Wireless charging Transportation, SMFIR, Battery, WPT, Eco friendly

P41: Multiplication and Growth Evaluation of Tricoderma.virdi using 145ptimiz as a Substrate

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T.viride is a widely used as a biocontrol agent against various plant pathogenic fungi. It has high efficiency to secret bioenzymes that degrade the cell wall of other fungus. Trichoderma genus is most promising, reliable and ecofriendly approach apart the use of harmful chemicals. The main problem evolved in application is effective strain, high cost of multiplication, availability and storage difficulty it is not ecofriendly to local farmers. To compensate this problem we were conducted experiments in liquid state fermentation, media with 152ptimiz (2%) and yeast powder (1%) up to 14 days and incubate the culture at 28^0 C in BOD .We were evaluate the CFU count after 5^{th}day of incubation is (2×10^4) 8^{th} day of incubation is (3×10^7) and 14^{th} day of incubation is (3×10^8).So the present study showed that easily available 152ptimiz and yeast powder used as a substrates and nitrogen source in liquid culture are potential source for production of T.viride.

Keywords- Bioenzymes, T.virdi, liquid state fermentation, Pathogenic fungi

P42: Reuse of Dyes and Other Materials from Discarded Flex Banners

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Plastic material has been playing an important role in the form of economy in today's time. Thus say about flex banners which are made of plastic (PolyVinyl Chloride) and dye. Flex banner is very popular for publicity, which is being used a lot in currently. But once it is use, it is thrown into the environment as a waste, which is harmful for both the environment and health. Because Poly Vinyl Chloride (PVC) is non biodegradable and the dye used in flex is carcinogenic. According to this research, the dyes can be separated from the flex with the use of bio-adsorbents and can be reused and the remaining plastic material can also be reused. In this way the dyes are separated from the flex by organic solvent and treated with bioadsorbents, filtered by gravitational method. The collecting solution is qualitatively analyzed with the use of spectro-photometric techniques and this analysis confirms that the dye present in the collecting solution. This way, you can reuse discarded flex dye and PVC materials, creating a healthy environment.

Keywords: Flex Banner, Biodegradable, Poly vinyl chloride, Carcinogenic, Bio-adsorbents

P43: Phytochemical and Nutritional values of Vinegar

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Nowadays consumption of fruit vinegar increased its value for health. In our daily routine, we use many kinds of vinegar because of its several health-beneficial properties. Among the different types of vinegar, fruit vinegar is popularly consumed as a functional beverage in modern days. One of the most commonly studied vinegar is sugarcane vinegar. Sugarcane vinegar has various bioactive compounds such as flavonoids, alkaloids, polyphenolic compounds, tannins, saponins, anthraquinone, terpenoids, and glycosides. Sugarcane vinegar has its own health-promoting properties and it is a good alternative to other fruit vinegar like apple cider vinegar and grapes vinegar. In addition, sugarcane vinegar also contains amino acids, vitamins, and minerals such as calcium, phosphorus, manganese, zinc, and iron. Sugarcane vinegar is produced through the processes of alcoholic fermentation and ethanolic fermentation. Acetic acid is the main component present in sugarcane vinegar. It can improve the absorption of nutrients in the human body. The addition of vinegar can not only adjust the taste but also eliminate bacteria and toxins in the dishes.

Keywords: Sugarcane vinegar, Phytochemicals, Fermentation, Fruit vinegar, Apple cider vinegar.

P44: Impact of Germination on Nutritional and Anti-Nutritional Factors In Millet Grains

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Commonly consumed millet types viz., pearl millet and finger millet were tested under the processing method of germination at 30°C for 48hr after soaking. The present study was conducted to evaluate the effect of germination on nutritional, anti-nutritional, total phenolic content, and antioxidant activity (DPPH) in millet flour. The nutritional composition of millet flour was analyzed using AOAC methods. Anti-nutritional and antioxidant properties were measured in terms of oxalates, tannins, and total phenolic contents. The results showed that the sprouting process showed a maximum influence on the nutritional, antioxidant, and antinutritive factors. The total ash content for WRFMF (Whole Raw Finger Millet Flour), GFMF (Germinated Finger Millet Flour), WRPMF (Whole Raw Pearl Millet Flour), and GPMF (Germinated Pearl millet flour) was 2.8±0.17, 2.7±0.10, 2.88±0.08 (g/100g) and 2.91±0.03(g/100g). Finger and pearl millets are a good source of protein and in the same line protein content was 6.5±0.20 in WRFMF, 8.8±0.30 in GFMF, 7.1±0.3 g/100g in WRPMF, and 9.1±0.2 g/100g in GPMF. Mineral analysis of processed forms of finger millet revealed that calcium and iron content increased significantly during germination as followed by pearl millet. Tannin content decreases with an increase in germination. The reduction in tannin was about 50% in finger millet (0.347 mg/g) and the highest was recorded in pearl millet (2.12 mg/g). The highest amount of saponin content was found in finger millet (35.53 mg/g) followed by pearl millet (32.86 mg/g) after germination. Phytic acid content for WRFMF was 821.4±1.6 mg/100g, in germination it was 248.5±1.3 mg/100g (GFMF) and in WRPMF it was 713.1±1.07 mg/100g (WRMF) while in GPMF was 313±1.2 mg/100g. It also increased the DPPH radical scavenging activity of millet flours. As germinated millet flours are a rich source of antioxidant properties with good radical scavenging activity could be recommended to develop functional foods for the treatment of various degenerative diseases. Household food processing strategies likegermination can be used for improving the nutritional quality to promote finger millet and pearl millet utilization.

Keywords: Finger millet, pearl millet, germination, anti-nutritional, antioxidants

P45: A review; Study on Medicinal Properties of Ganoderma Lucidum

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Ganoderma lucidum is a red coloured, double –walled basidiosphere species of Ganoderma produced by porous basidiomycetes fungi, it is used as a traditional medicine from thousands of years, containing a wide variety of some active ingredients including polysaccharides, triterpenoids, alkaloids, nucleotides, sterole, polypeptide, steroid also has anti-inflammatory anticancer, anti-ageing, Anti-melanogenesis and some skin repairing barrier activity. It is also utilized as a therapeutic agent for treating disease like cancer.

Many products of healthcare, food & beverage are made by using its extract. This study provides a better understanding and general updates about the medicinal uses of Ganoderma lucidum, its current market scenario and its potential in Indian markets.

Keywords: Ganoderma lucidum, Medicinal properties, Basidiomycetes, Anti-inflammatory anticancer etc.

P46: Role of Sulphur Recycling Bacteria in Acid Bioleaching in Mines and A Potential Replacement with a Strain of Bacillussubtilis

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Sulphur is an essential element in nature which plays an important role among humans, animals, plants and even microbes for that matter. Sulphur recycling bacteria on the other hand metabolize sulphur via oxidation and reduction processes and prove to be extremely essential in the natural environment of living entities. These organisms have the quintessential property of adapting to various habitats, i.e., flexibility; giving rise to a vast multitude of applications, thereby making them multidimensional.

The various important uses of the Sulphur recycling bacteria include maintaining the sulphur cycle in our environment, solubilisation of heavy metals, restoration of nutrients and elements for proper growth of plants, biomining, sustenance of mangrove forests, biotreatment of acid mine drainage and oil reservoir souring. In this paper we solely aim to focus on the acid bioleaching of metals with the help of SOB/SRB and provide a potential alternative to it from our own research. We have isolated a strain of Bacillussubtilis namely BRAM_G1 which may prove to be a potential replacement for the sulphur-recycling bacteria in the acid bioleaching of solid wastes.

Keywords- Sulphur recycling bacteria, sulphur cycle, solubilisation, biomining, acid mine drainage.

P47: Impact of Climate Change on the Efficacy of Bacteriophage in the Control of MDR Bacteria

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Phage therapy, a technique for treating bacterial illnesses, makes use of bacteriophages, viruses that are specifically designed to eradicate bacteria. The use of 156ptimize156ion156156 as a controlling agent for bacteria was introduced in 1917 but with time it gradually became ineffective due to their toxicity and bacterial resistance. It is important to understand phage sensitivity to external climatic factors which may be useful for both pharmaceutical and agricultural applications including working with phages. Due to its basic function in attachment, penetration, multiplication, etc., temperature is a key element in 156ptimize156ion156156 survival. Fewer phage genetic components enter bacterial host cells at temperatures below optimum levels, which limits the number of them that can participate in the multiplication phase. The latent stage can last longer in environments with higher temperatures. Furthermore, bacteriophages' incidence, viability, and storage are all influenced by temperature. Therefore, temperature plays as one of the most important factors in the survival or functioning of the bacteriophages. The environment's acidity is a significant element affecting the stability of phages. In response to external factors, the phage population is often steady. With pH increase, phage titers often decline gradually. Below pH 4.5, there is often less of a chance of harmful bacteria contaminating food as well as a restriction on the growth of numerous phages. The phage activity, infection and lysis of the host bacteria is influenced by the type and particle size of the clay mineral as many soil properties are affected by changes in temperature and rainfall. Another important factor that affects the efficacy of bacteriophages is water. For example, water in soil helps to determine how frequently the phage and the host bacteria come in contact with each other by helping in the mobility of the phages. The evaporation of soil water can lead to total loss of phage activity. Oxygen content can also affect the infection capacity of phages. This article, thus, investigates the effect of all these climatic factors on 156ptimize156ion156156 efficacy against MDR bacteria and how the efficacy changed over time.

Keywords : MDR, Phage therapy, temperature, pH, salinity.

P48: Environmental Stress Indicators and Omics Technology

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Omics technology is claimed as the next generation tool for ecosystem assessment. It provides a new insight in molecular changes occurring in a cell, tissue or whole organism at the genetic ,mRNA, protein and metabolic levels. Environmental omics is used to understand the environment and its toxicity mechanisms and its response to exposure to stressors using genomics, transcriptomics, proteomics and metabolomics. Environmental stress is a response of the environment and its organisms to negative stimuli i.e. the stressors which influence the environment. Environmental stress analysis using genomics screened four number of genes in Escherichia coli which are associated with forming biofilms to distinguish substances with narcotic action. Transcriptomic study on European eels (Anguilla 157ptimize) showed that expression of mRNA transcripts of hepatic and gill genes were lowered, when exposed to aquatic pesticide contaminants. Antibacterial chemicals such as sulfonamides used in agrarian and medical setting are discerned in riverine ecosystems using integrated omics approach. The omics technology has increased the efficacy of ecosystem assessment. However, there are certain limitations and the environmental microbiomes are largely underrepresented in the omics database. The success of omics in ecology requires improvement in omics analysis to obtain an universal view to protect environmental health.

Keywords- Omics Technology, Genomics, Transciptomics, Proteomics, Metabolomics, Ecotoxicology, Bioremediation, Environmental Stress Indicators

P49: Tephrosia falciformis Ramaswami A Threatened Plant of Rajasthn, India

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Rajasthan is one of the most diversified state in India covering two biogeographic zones i.e. Arid and Semi-arid zones with an area of 3,42,239 km^2. The Thar Desert lies in the NorthWestern part of the State and spreads over an area of 2,08,591 km^2. The State has a total forest cover of ca. 4.62%, in which 9% falls under Semi-arid region and the scrub forest cover is around 4,564 km^2. Rajasthan harbors around 2400 flowering plant species whereas around 670 flowerings plants occur in Thar desert area. In this habitat around 16 different endemic plants have been recorded. Tephrosia falciformis Ramaswami is also one of the threatened plant of Indian desert. T. falciformis commonly known as 'Rati-Biyani' is 3-4 feet high under shrub. It is a rare and threatened plant species of Rajasthan and distributed in Ajmer, Churu, Jaisalmer, Jodhpur and Pali, especially in the Indian Thar desert. Shrub with angled, white silky branches. Leaves imparipinnate with 7-9 pairs of leaflets, Leaflets oblanceolate or oblong, mucronate or 158ptimize158io, appressed hairy. The urbanization, over-grazing, forest land encroachments, over exploitation of timber and fire-wood, excessive collection of non timber forest products like MAP are the main anthropogenic pressures that have led to loss of biodiversity. Recent studies reveal that T. falciformis species is degraded very fast due to habitat loss. Hence, there is an urgent need to document the population status and distribution of rare endemic species in Rajasthan. Recent enhancement in human activity in this region has led to degradation and fragmentation of its habitat. Thus there is urgent need to formulate a long term conservation strategy for this threatened and rare plant of Rajasthan.

Keywords: Endemic & Threatened plants, Arid & Semi-arid region, Rajasthan

P50: Green synthetic Approach for Cu-nanoparticles: A Promising Strategy Towards Environmental Point-of-view

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The release of nanoparticles in our ecosystem has drawn considerable amount of attention due to serious health and environmental issues. It interact with water, air and soil which results in aggregation by changing the surface charge. The exposure of these nanoparticles to living system caused cytoxicity, genetoxicity, inflammation, reactive oxygen species generation and immunotoxicity. Here, we used the copper (Cu) nanoparticles as a model for both synthetic approach (green and chemical) and compare this study torely on significant amount of energy and use of heavily toxic reducing chemicals. This study showing how chemical synthesis approach method for the nanoparticle can pollutes our ecosystem. The green synthesis of nanoparticles from plant extract is a means to eliminate the pollution caused by the conventional methods. Nanoparticles synthesize by plant are more stable and the rate of synthesis is more efficient. The characterization of Cu nanoparticle through UVvis spectroscopy and Fourier Transform Infrared spectroscopy (FTIR) with characteristic surface 158ptimiz absorption peak ranges between 350 nm-400 nm. In this study, we synthesized copper nanoparticle using various plant extract which are cost-effective, ecofriendly and simpler approach.

Keywords: Copper nanoparticle; Environmental challenges, Eco-friendly; Green synthesis.

P51: Situation of Air Pollution in Delhi

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Pollution is the contamination of the environment by introduction of contaminants that cause damage to environment and humans or other living species. Environmental pollution is one of the greatest challenges that the world is facing today. The air pollution levels in India worsen in the year 2022 as per data released by central pollution Control Board. Delhi is the most polluted city in the world. We are aware of ill effects of environmental on human health and other living species. Exposure to high levels of air pollution can cause a variety of adverse health impacts. It increases the risk of respiratory infections, heart disease and lung cancer. Both shortand long-term exposure to air pollutants have been associated with health impacts. The children, elderly and the poor people are more susceptible. Some significant measures should be taken to prevent environmental pollution.

P52: Assessment of Municipal Solid Waste and Characterization

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The central pollution control board stated a comprehensive study cum assessment of MSW dumped in towns / cities. Here, in the city of Purnea, Bihar the waste disposals are of unplanned way. The compost of MSW were collected, processed and characteristically analysed for various physicochemical parameters including heavy metals. The mean or average values of various specified parameters were determined and compared with the standards as prescribed in 2000 rules of MSW and its compost. The concentration of heavy metals are within the limits, however the solid domestic garbazes are causing under ground water contamination as dissolve and percholates up to thrwater table.

Keywords- Municipal solid waste-MSW, Physicochemical characteristics, Heavy metals

P53: A Study on the Faulty Distribution, Storage and Consumption Habit of Poultry Eggs in Retail Market

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While a small packet of Biscuits is sold with a Best before Use Date, a highly perishable entity like egg is freely distributed without any best before use warning. No dependable test is followed on egg purchase. But unknowing consumption of eggs under the process of degradation could invite serious health issues. Moreover the typical habit of offering undercooked egg recipes like poached and half boiled eggs to children, elders, patients etc could further aggravate the hazard. The problem is explored with a hope that it may bring in some significant regulatory changes in the retail egg distribution chain.

Keywords: Eggs, Best before Use Date, Egg Recipes, Health Hazard

P54: Isolation and Characterization of Microorganism from Betel Quid

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Betel Quid is a traditional mouth freshener eaten after a meal for digestion in India. The objective of this study was to determine the microbiological assessment of Betel Quid sold at different locations in Delhi. The present scenario shows that contamination of Betel Quid has become a health concern. The continuous and high consumption of Betel Quid may lead to diseases like diabetes, stroke, and cardiovascular disease (heart attack, and high blood pressure). The roadside commonly available Betel Quid consumed by the majority of the population is considered vulnerable from a hygiene point of view. A total of 30 Samples i.e. 15 Sweet Betel Quid and 15 Zarda Betel Quids collected from areas of Delhi. The Sweet Betel Quid Total Plate count ranged from $1.7x10^4$cfu/g – $1.2x10^7$cfu/g and Yeast and Mould count ranged from $1.7x10^3$cfu/g-$7.1x10^5$cfu/g. Whereas in Zarda Betel Quid samples the Total Plate count ranged from $2.0x10^4$cfu/g-$2.5x10^7$cfu/g and Yeast and Mould count ranged from $5.1x10^2$cfu/g-$7.5x10^5$ cfu/g. The present study also showed the dominance of pathogenic microorganisms, which include Escherichia coli (73.33%), Staphylococcus aureus (66.66%), and Pseudomonas aeruginosa (50%). These microbes in Betel Quid may increase the risk of different related diseases and health problems in humans. Further to this, all the bacterial isolates were checked for their antibiotics susceptibility pattern against 8 clinically significant antibiotics (Amoxycillin, Ampicillin, Cefepime, Ciprofloxacin, Cefpodoxime, Cefuroxime, Meropenem, Ofloxacin). The antibiotics used in the study with a maximum zone of inhibition of 40.48mm (var.Sweet) and 50.64mm (var.Zarda).

Keywords: Betel Quid, Public Health, Escherichia coli, Pseudomonas aeruginosa, Staphylococcus aureus, Antibiotics.

P55: Green Synthesis of Nanoparticles Using Tulsi Leaves Extract for Adsorption of Cd(II) From Synthetic and Electroplating Wastewater

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This study illustrates the synthesis of iron oxide nanoparticles as a green and eco-friendly approach using Tulsi leaves extract. Tulsi leaves extract used in synthesis of zerovalent iron nanoparticels is used as green reducing agent which contains various biomolecules. The synthesized nanoparticles were used for the removal of Cd(II) from the synthetic and electroplating wastewater. The results indicated that the maximum removal found in the case of the synthetic solution was 99.6 percent and for electroplating wastewater was 60.1 percent. The Langmuir isotherm is best fitted for adsorption data using IONPs synthesized via the green synthesis method, having an r 2 value of 0.9722. So, this study reports a green and ecofriendly approach for the remediation of Cd ions from electroplating wastewater.

Keywords: Green synthesis, of zerovalent iron nanoparticels and wastewater.

P56: Optimization of 161ptimize161 Enzyme Production from Micro-fungi for Agriculture Application

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Cellulase enzymes are belonging to the hydrolytic group of enzymes facilitates the sugar release and its bioconversion into a variety of value added industrial products. Fungus isolated from rice straw by dilution plating pouring method studied for playing a various role in industries as well as in agriculture application. Enzymatic degradation of lignocellulosic material has been done by various fungal strains. In the present study, the growing conditions for 161ptimize161 for Aspergillus 161ptimize161 were optimized. Optimization of various conditions such as temperature, various pH level and nitrogen source were studied for the production of extracellular carboxymethyl 162ptimize162 during this study. The results showed that Aspergillus fumigates produced highest 162ptimize162 activity (6.19 IU/ml) at pH 7, and temperature 30^0C with yeast extract and Fpase activity (0.921IU/ml) through solid state fermentation. In future agriculture applications and in industries the 162ptimize162 enzyme production attains a vital role to obtain degradable yield.

Key word: Dilution plating method, Lignocellulosic, solid state fermentation, carboxymethyl 162ptimize162, Fpase

P57: Corals Mitigations to Save the Vulnerable Submerged Communities

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Corals are among the richest, most distinct, and productive ecosystems on the world, but one of the most exposed and negatively affected territories as they've sustained tremendous losses due to anthropogenic disruptions and climate change stipulations. Coral reef structures are formed by huge deposits of calcium carbonate produced by hermatypic coral that lives in symbiosis with zooxanthellae. The coral micro-biome includes dinoflagellates, viruses, fungi, archaea, and bacteria. Corals are microbially driven ecosystems that depend on the effective capture, retention, and recycling of nutrients to flourish in oligotrophic waters. They're the typical mutually salutary symbiotic organism with various symbiotic microorganisms that play important parts in keeping up holobiont wellness and ecosystem flexibility under environmental stress and also in positive feedback circles that heighten coral reef decline, with balancing effects on biogeochemical cycles and marine food webs. Ecologically, coral reefs are the feeding, breeding ground, and begetting places for numerous marine organisms. They're of three types – hard, soft, and deep- ocean corals. The extent for loss associated with the degradation of coral reef systems is economically, biologically, physically, and culturally immense. The universal dangers that bring about severe deterioration of corals are- climate change; greenhouse gases leading to coral bleaching and ocean acidification, coral diseases, and microplastics. Hence, the acclimations and mitigations that should be adopted to save the corals are- reduction and re-usage of plastics, reduction in carbon emission, and coral restoration. There's a critical need to develop a basic understanding of the complicated microbial relations within coral reefs and their task in ecosystem adaptation, and it's important to include microorganisms in reef conservation to secure a future for these unique surroundings. Researchers must do widespread investigation to assess the uses of microbial shifts for host health and coral reef processes.

Keywords- Coral reef, coralmicro-biome, hermatypic, algal endosymbionts, zooxanthellae, holobiont, biogeochemical cycle, carbon emission, climate change, coral conditions, microplastics, ocean acidification.

P58: Development and Quality Evaluation of Oats and Barley Cookies using organic 163ptimiz

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Jaggery (Gur) is the natural sweetener and available in solid, liquid & powder form. The micronutrients which are present in Jaggery have many nutritional & medicinal aspects like its anti carcinogenic & antitoxic activity. Jaggery has proved itself better as compared to white sugar. Jaggery is known to produce heat and give instant energy to a human body. Cereals are highly nutritious and are known to have good nutritive value and therapeutic use. Oats and barley are providing more phytochemicals and antioxidants which should be in demand for maintaining a good health status. In developing countries like India with increasing urbanization, the demand for processed food is increasing popularly. Hence, an attempt was made to develop value added 163ptimiz millet cookies with acceptable sensory attributes. The present study was conducted for formulating cookies by substituting cereals flour from oats and barley, evaluating 163ptimi-chemical parameters; storage life and consumer acceptability of selected and accepted products were conducted. The cookies were prepared in six different combinations by replacing the amount of wheat flour (WF) with the composite flour (CF) i.e. T1 (100:00), T2 (90:10), T3 (80:20), T4 (70:30), T5 (60:40) and T6 (50:50). Sensory evaluation of cookies was done by the 9 point hedonic scale based score card. The nutritive of cookies was calculated using food composition table. The findings revealed that, Sensory evaluation of prepared product T5 was highly acceptable on the basis of overall acceptability for cookies. The treatment T5 was found to have the highest nutritive value with increase in protein (7.51%), fat (14.5%), crude fibre (4.01%) and calcium (160.6mg/100g). Iron (3.43mg/100g) and potassium (250.0mg/100g) were higher in T6 treatment respectively. So it was concluded from the results that the value addition of incorporation of combination of oats and barley flour at different level can improve the nutritional quality of organic 163ptimiz cookies. These cookies had shelf life of 60 days. Consumer acceptability showed that none of the product was in “dislike” category for the developed cookies. Jaggery (Gur) is a natural sweetener made

byconcentration of sugarcane juice, contains all minerals andvitamins present in sugarcane juice.Jaggery (Gur) is a natural sweetener made byconcentration of sugarcane juice, contains all minerals andvitamins present in sugarcane juice.

Keywords: Oats, barley,Organic 164ptimiz, cookies, nutritive value, consumer acceptability

P59: Development of Immune Boosting Organic Jaggery using Beetroot and Cinnamon

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Jaggery is a traditional natural sweetener made by concentration of sugarcane juice and it is considered to be the best among all sugarcane products which is enriched with mineral, phytochemicals and antioxidant. In general, 164ptimiz which is commercially available is not safe because a huge quantity of harmful chemicals used during its production processes. In India, 164ptimiz manufacturing is done by farmers or local processors using unskilled manpower's and most of the units are running under very low profits margins. Therefore, a research work was formulated to develop a suitable protocol for production of immune boosting organic 164ptimiz during the month of January, 2021 to October, 2022. Beetroot and cinnamon known to rich in phytochemical and antioxidant that fight cell damage and reduce the risk of disease, which were considered for these studies such as dried beetroot powder (B, 0.0-0.4%) and Cinnamon (C, 0.0-4.0%) with various treatment combinations such as T1(B, 0.0%+C,0.0%), T2 (B, 0.2%+C,0.0%), T3 (B, 0.4%+C,0.0%), T4 (B, 0.0%+C,2.0%), T5 (B, 0.2%+C,2.0%), T6 (B, 0.4%+C,4.0%), T7 (B, 0.2%+C,4.0%) and T8(B, 0.4%+C,2.0%). The final products were evaluated for different qualities viz. colour, texture, flavor, taste and overall acceptably along with physical and chemical properties. Among different treatments, the maximum overall organoleptic score (7.6±0.2) was recorded for sugarcane juice treated with T6 (B, 0.4+C, 4.0%) followed by (7.4±0.3) in T5 (B, 0.2%+C, 2.0%). Farmers reported that such value addition in 164ptimiz; they could able to sell their produce @ Rs. 75/kg and more, instead of regular selling price of Rs.30-45/kg in the local markets

Keywords:164ptimiz, sugarcane, value addition, organic, beetroot, cinnamon

P60: Study the Agaricus Bisporus Mushrooms using Different Drying Methods and Pretreatments

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Mushrooms are edible fungi of commercial importance. Drying of fruit is one of the oldest forms of food preservation techniques known and consists primarily of establishments engaged in sun drying or artificially dehydrating fruits and vegetables. Mushroom slices were subjected to various pre-treatments namely steeping in normal water for 25 min with MgCl2 (0.1%) + KMS (0.1%), blanching (immersed in boiling water at 100^0C for 2 min), blanching plus steeping, blanching plus steeping with 0.25% KMS and 0.25% CA. After each pre-treatment, mushroom samples were dried by sun-drying andtray drying. Each sample was dried from an initial moisture content of 92% wb (1566% dB) to the final moisture content of 5% wb (6% dB). Immediately after drying, samples were cooled at room temperature and packed in LDPE (200 gauge) packaging material. Quality parameters in the form of Physico-chemical and sensory will be monitored at an interval of 30 days. The study revealed that tray dryer dried samples resulted in the highest percentage of moisture loss during 30 min of drying followed by sun drying, irrespective of pre-treatments. It was found that untreated samples had comparatively higher ash content for all drying methods but among all the drying methods and pre-treatments, steeped with NaHCO3 + KMS treated tray dried (60^0C) samples were found to have higher ash content. pH was found maximum in NaHCO3 + KMS treated steeped samples whereas, sun-dried mushrooms have higher pH followed by tray drying (60, 70 & 80^0C). It was observed that among all the drying methods and pre-treatments combination of blanched plus steeped sun-dried samples was found to have higher protein content. Blanched tray dried (60^0C) mushroom samples resulted in minimum values of the browning index than those of other pre-treatments irrespective of drying methods. For sensory attributes it was revealed that the tray dryer at 60^0C rated the highest score for color, texture, and overall quality whereas among the pre-treatments, steeped in MgCl2+KMS solution samples got a higher rate in color and combination of blanching plus steeping in KMS+CA solution samples are found to have the highest score for texture. So, it can be concluded that the mushroom samples pre-treated steeped in MgCl2+KMS solution and tray dried at 60^0C temperature exhibited the best results over the other pre-treatments and drying methods before and

after storage of four months at room temperature. Therefore, the above pre-treatment and drying method could be recommended for drying mushrooms.

Keywords: Mushrooms, protein content, pH, sensory.

P61: Sustainable Development and Indian Legal Perspective

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The rising environmental problems call for immediate actions in the form of sustainable development to meet the future needs of upcoming generations. Sustainable development aims at bringing in better changes for environmental protection with due regard to the economic and social factors of the present population. The Indian legal is contributing for a clean environment through series of environmental legislations namely Environment Protection act 1986, Water Act 1974, Air Act 1981 and Forest Act 1980. The judiciary has emerged as the key protector of the environment through landmark judgment in the matters of Vellore Citizens, Indian Council for Enviro Legal Action, Narmada Bachao, M.C Mehta by developing new principles and customs for a clean environment. The Present paper will understanding the Indian legal perspective over environment for a viable earth.

Keywords: Sustainable Environment, Judiciary, Indian Legislations, Future Generations, Clean Environment.

P62: Environmental Impact of Nuclear Power & its Legal Concerns

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Nowadays nuclear power is one of the major source for producing electricity. The electricity is being produced by nuclear fusion of uranium and plutonium in nuclear power plant. The main environmental impact of nuclear power is related to building the plant, fuel procurement and the thermal load of cooling water discharged into the sea during operation. Of these three things, the most significant environmental concern is the thermal load on the sea caused by the cooling water. This thermal load on the sea contribute in greenhouse heating under water, effect on environmental ecosystem, effect aquatic system. If any damage is caused due to nuclear power plant then liability can be decided with the help of The Civil liability for Nuclear Damage Act, 2010. This act only prescribes for the law and procedure on the liability for nuclear damage but it has ignored the day to day environmental concerns arising out of nuclear fission which is used to generate electricity. This Act provides for civil liability for nuclear damage and prompt compensation to the victims through the no-fault liability regime 166ptimize166i liability to the operators. In this paper author will assess the impact of nuclear power on environment and the author will also highlight the how Nuclear Damage Claims Commission works and key highlights of The Civil liability for Nuclear Damage Act, 2010

Keywords: -nuclear power, thermal load, sea, environment, aquatic system.

P63: Ballast Water and its Effects on Marine Environment

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Vessel sourced marine pollution is an imminent danger to a healthy marine environment, it may severely harm the marine ecosystem, species, and human wellbeing. Apart from the human health and environmental degradation, it economically effects the population of the coastal states as their welfare is largely dependent on a sound marine environment. In this way it appears that that the protection and preservation of the marine environment is of vital importance to the entire international community. Ballast water is an example of vessel sourced pollution. It is generally used to make sure that the ships are operated safely while they are en-route as it helps in balancing the unladen ships by providing stability. But at the same time, it transfers marine organisms (Known as Alien Species) which competes with the native species and may sometimes results in extinction or deterioration of indigenous species. Ship's Ballast water is an impending danger to marine environment as it may harm its species, ecosystem, and human wellbeing. Hence, this article aims to study the concept of ballast water and its impact on marine environment along with the current legal framework regulating the same.

Keywords– Ballast Water, Vessel Sourced Marine Pollution, Marine Ecosystem, Coastal/Port State, BMW Convention.

P64: Protection of Marine Environment from Vessel Sourced Pollution

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In today's world, marine ecosystems and its environment are being degraded, threatened, destroyed, or damaged by human endeavours, one of which is vessel sourced pollution. Marine pollution reduces the intrinsic as well as the aesthetical value of the marine environment, either in visible or invisible mode. The oil spill incidents in Mauritius, the United States along the Gulf of Mexico and tanker container collision in India along the Chennai and Mumbai Coast are vivid instances. Another major cause of concern about marine pollution is directly related to the effects of pollution on human health as various pollutants accrue in marine organisms and are exposed indirectly to human beings when they consume food from these polluted environments. Therefore, this paper will examine the sources of vessel sourced pollution and its impact on marine environment along with the current legal framework which are present to protect and preserve the marine environment.

Keyword– Vessel Sourced Pollution, Marine Ecosystem, Marine Environment, Coastal/Port State, UNCLOS.

P65: Distribution of Aquatic Angiospermic Plants in Jharkhand and its impact

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Jharkhand state is situated in the western part of the India, boardering Bihar on the northern part, West Bengal on the eastern part, Orissa on the south and Chattisgarh and Uttar Pradesh on western side. The state is divided into four administrative division namely, Santhal Pargana, South Chotanagpur, North Chotanagpur and Palamau with 24 districts. The total land area of the state is 79,714 sq. kms. The state is reach in water bodies like dams, (Panche, Kanke, Rukka, Topchanchi, Maithon, Konar etc), Lakes, Ponds, Rivers and Waterfalls besides the seasonal Nalas. All these water bodies harbors a number of plant biodiversity. These plants are called aquatic plants.

Aquatic angiosprmic plants are those unabated plants which grow and complete their life cycle in water. These are normally herbaceous and rarely shrubby in nature. Most of these aquatic plants can grow very fast, and directly or indirectly interfere in the human activities.the excessive growth of these plants are considered as weeds. These weeds influences adverse physical chemical and biological effects on water bodies, with its resultant aesthetic and economic lossess. It is also very tough to control these plants, because very less is known about growth and development of the same. These plants also affect the water bodies in several ways. Like It clogs the passage and intake points. It also clogs the culverts, bridges, nalas. Tiny phytoplanktons, pond scums, and duckweeds clog screens, siphons and sprinklers of modern agricultural systems. Disrupts navigation and other recreational activities such as water sports.

Aquatic weeds threaten efficient working of hydroelectric plants by infesting their reservoir and tanks, Interference in netting, Reduce fish growth, increased loss of water, damage to low land and water crops, spread of diseases, destruction of water bodies or reduction of water depth etc.

In the present communication Dsitribution of Aquatic Angiospermic plants in Jharkhand and its impact have been discussed in detail.

Keywords-Aquatic Angiosperms, Weeds , Jharkhand , Impact etc.

P66: Polyurethane – Role of Degradability in Making of Environmentally Compatible Equipment

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Polyurethane (PU) is a particular class of polymers made from the processed condensation of polyisocyanate and polyalcohol. It is a composite material made up of: (1) one or more layers of polymer resins joined by urethane links; and (2) a woven or non-woven textile backing such as polyester, cotton, nylon, or ground leather.

Nowadays the application and use of PU has been increased over the years because of its versatile dimensions of utility in manufacturing of industrial- and environmental protection equipment advantages. But many oppose the use of PU being confused with the one-time used plastic that may harm the quality of the natural environment like marine and coastal ecosystems.

This is a review paper that clarifies the confusion about the PU, differentiate between the activities of PU and general plastic, and finally suggests the reasons of PU compatibility for making of equipment to prevent environmental degradation.

Keywords: polyurethane parts, environmental compatibility, marine & coastal ecosystem, mining equipment

P67: Conservation of Biodiversity

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The most precious gems of mother nature is biodiversity. Biodiversity or diversity can be observed in every life forms such as plants, aquatic marine life, birds and terrestrial animals. Under this topic we will discuss about what are threats to biodiversity and how to preserve them from various catastrophic events and human activities.

Keywords: Mass extinction, alien species invasion, genetic, species, and ecosystem diversity.

P68: Probiotics Potential of Lactic Acid bacteria

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Probiotics are live microorganisms that confer health benefits when consumed in appropriate amounts by improving gut and intestinal microbial balance. There is an impressive number of microbial species that are considered as probiotics and one of the most is Lactic Acid Bacteria. They are first isolated from milk and can also be by fermented product such as meat, vegetable, beverages and bakery products. They are Gram's positive, low-GC, non respiring, non sporulating, either rod shaped or spherical bacteria that share common metabolic and physiological characteristics.They are group of bacteria that include genera such as Lactobacillus, Lactococcus, Pediococcus, Enterococcus, and Streptococcus and are frequently found in dairy fermented food. After their discovery, LAB has gained much attention in various applications as feed fermentation, pharmaceuticals, probiotics, biological control agent and as starter culture in food. They are generally regarded as (GRAS) to the consumers.

Keywords: Microbial balance, LAB, Dairy foods, GRAS

P69: A Review on Advantage of Green Implosion Technology in Water Treatment as Compared to Traditional Treatment Technology

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Water pollution can be defined in many ways. Usually it means one or more substance have built up in water such an extent that they cause problems for living organism and environment . Quality of water is the major concern among all humans. Most of the available water can't be used directly. There are some traditional techniques which are commonly used for treat water for its best use. In present research work a green implosion technology is introduced for the contaminated water treatment for sustainable development. Traditional techniques involve filtration, ultra filtration, reverse osmosis, UV treatment, chemical treatments etc. All these techniques for water treatment are used singly or in combined form. All these techniques have some advantages and some disadvantages. In present research work green technology (implosion technique) is incorporated to make effort by treating through various methods for making the water potable. Reverse osmosis is the major technique used for water treatment along with filtration and uv treatment. One more technique which in not used in general practice but can be very useful is implosion technology. Filtration is the technique which only removes suspended particles; it does not work on dissolved solids. For bacterial contamination UV treatment is effective. Reverse osmosis effectively removes the dissolved solids and minerals; this may cause harmful impact for the living organism and environment on regular use. The study shows that reverse osmosis decreases dissolved solids from 60 to 95 %, a sharp decline in ph of water is also observed after reverse osmosis which is not suitable for living organism and environment. Green implosion technology is the only technology which does not impact negatively on living organism and environment. It makes positive effect on the chemical property of water as it removes turbidity from water (20 to 80%), make appearance and taste better, increases the level of dissolved oxygen (5 to 20%), removes hardness to little extent (10 to 30%), and also helps to remove bacterial contamination in some cases. Implosion technique maintains the mineral content in water. This green implosion technique is cost effective and

sustainable for water treatment . Hence it is concluded that for the water which have acceptable dissolved solids (150mg/l to 600 mg/l) implosion technique is best for use, reverse osmosis is best to use when dissolved solids in water are much higher (>600mg/l). These all techniques may be used in combination of two or more for obtaining desired water quality.

Keywords: Implosion, UV technique, Filteration, Reverse Osmosis, dissolved Solids, water quality.

P70: Arthropod Microbiota: Its Rolein Ecosystem Conservation

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According to recent reports, the condition of our planet is deteriorating and urgently needed transformational reforms. Since these frequently deviate from existing understanding of the underlying ecological processes, efforts to alleviate Earth's ecosystem crises have thus far fallen short. Our species' ability to survive is currently threatened by biodiversity loss and changes to the biogeochemical cycles. For ecological processes to be conserved and restored biologically, especially those that support nutrient cycles, biological interactions are essential. Microorganisms, both free-living and in symbiotic relationships with multicellular organisms, are acknowledged as crucial participants in ecological interactions and the cycling of nutrients. Here, we review the emergent ecosystem traits obtained from holobionts, which is the term used to describe the latter assemblage's work as a functional ecological unit. Here, we explore the holobiont-derived features of emergent ecosystems with a focus on detritivorous terrestrial arthropods and the symbiotic microorganisms they harbour. We go over their importance once more with regard to the cycling of refractory organic molecules (e.g., lignin and cellulose). Last but not least, we suggest that an ecosystem holobiont is made up of a multicellular organism and its associates based on the relationship between biodiversity and nutrient cycling (EH). The primary ecosystem processes that 172ptimize172ion this EH are carried out by it. We stress the importance of reducing anthropogenic pressures that may endanger not only individual entities (also referred to as "bionts") but also the stability of the associations that give rise to EH and their ecological functions in order to meet the challenge of restoring the health of our planet.

Keywords-Holobionts, arthropods, nutrient cycling, ecosystem.

P71: Water Quality Assessment of Dug Wells of Fatuha Vidhanshabha in Rural Patna District of Bihar for Irrigation Purpose

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Water pollution is the contamination of water bodies such as rivers, lakes, dug wells, ponds and ground water. This is mostly due to the urbanization, which increases the industrialization and use of chemicals fertilizers and pesticides in the agriculture. These chemicals, pesticides, untreated waste from industries and landfills finds their ways directly into the water bodies. In villages, mostly dug wells water is frequently used for irrigation of crops mainly vegetables, which animals consume in large quantities. The water of dug wells contains large quantity of various toxic pollutants due to which water quality of dug wells is deteriorating day to day. The present study was conducted to highlight the water quality of dug wells, and to assess its suitability for agriculture purpose. For this, total 56 samples of water from different dug wells of 24 villages e.g., Kothia, Sonama, Jeevan chak, Gyan chak, Khanpura, Gowharpur etc., of Fatuha Vidhanshabha in rural Patna, Bihar were collected and analysed for PH, total alkalinity, electrical conductivity, TDS, Sodium, Potassium, Magnesium, Calcium, Chloride, Fluoride, Nitrate, Sulphate, Carbonate, Bicarbonate and Phosphate. It is found that the concentration of Sodium, Potassium, Magnesium, Calcium, Chloride, Sulphate, Carbonate, Bicarbonate, Fluoride, Nitrate and Phosphate were present slightly over the permissible limits.

Keywords: water pollution, urbanization, industrialization, TDS, electrical conductivity

P72: Diversity of Cellulolytic Fungi in Orchha Wildlife Sanctuary, M.P., India

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Cellulases are a family of hydrolytic enzymes that may breakdown the organic polymer, cellulose to smaller constituents like glucose subunits. Cellulases have a wide range of applications in pulp, paper, textile, laundry, food and animal feed industries. The current study was executed with an objective to screen out cellulolytic ability of fungi isolated from degrading litter samples collected from Orchha wildlife sanctuary, M.P. Firstly, isolation of fungi has been carried out on Potato dextrose agar media then after, cellulolytic activities of isolated fungi were screened out on Czapek's Dox agar medium having 1% carboxymethyl cellulose as substrate. Fungal colonies were stained with 0.1% congo red dye, then observation for the appearance of clear zone was done. Thirty-three fungal species were used for the present study of which thirty were recorded as positive for cellulolytic activity. The maximum activity was achieved by Rhizopus stolonifer, Penicillium decumbens, Penicillium chrysogenum with cellulolytic index1.66,1.6 and 1.44 respectively.

Keywords: Cellulases, Litter, Fungi, Potato dextrose agar

P73: Environmental Laws towards Development: Efficiency to Protect the Concept Right to Life

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It is evident that the time has came when we have to think about our environment. The rise in conflict between Development and Environment but on the other side we have seen that since ancient times the knowledge of protecting and preserving the nature and environment had been practiced in some way or other, but due to increase in population and 173ptimize173ion there is gradual shift towards destruction of environment and thereby affecting the humans basic right i.e. Right to life enshrined under Article 21 of Indian Constitution. Legislations and the role of Judicial activism have contributed a lot towards the establishment of Environmental protection laws established in various cases, with special approach towards conservation and preservation of our natural resources.Though it is very difficult to analyse the legality of the nature but it has its own rules and rights.As of today there is need to shift towards the adoption and implementation of Sustainable development concept which will help to protect our Only One Earth.

Keywords: Environment, Legislation, Judicial Activism, Laws, conservation, protection, &Only One Earth.

P74: Effect of Dual Inoculation of Rhizobium and Mycorrhiza on the Growth of Two varieties of Cicer arietinum L.

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The impact of Rhizobium and mycorrhizal fungal spores on two varieties (RVG 202 and Radhey) of Cicer arietinum (Chickpea) was studied in this research. In the research field of the Bipin Bihari College Jhansi, Uttar Pradesh, seeds of chickpea varieties RVG 202 and Radhey were sown. Chickpea seeds were inoculated individually and together with Rhizobium and mycorrhizal spores. After germination, measurements of plant height, plant weight, the number of root nodules and number of pods, amount of chlorophyll, leaf area, and total yields were recorded. This data was measured after 30, 45, 60, 75, 90, and 120 days after sowing. According to the findings of these tests, mycorrhiza and Rhizobium had a good impact on the growth and yield of chickpea plant. When Rhizobium and mycorrhiza are inoculated together, the results are better than when they are inoculated separately. On the basis of above study it can be concluded that seed dressing before sowing will certainly reduce dependency over chemical fertilizers.

Keywords: Mycorrhiza, Rhizobium, Cicer arietinum L.

P75: Water Quality along the Riparian Zone of Nambul River, Manipur

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Riparian vegetation constitutes the filtering zone between the aquatic ecosystem and adjacent landscape. It plays a very important role in retaining nutrients, sediments, and organic matter in the local riparian area there by reducing the input of nutrients from the non point sources and thus contributes substantially to their ability to affect water quality .

The Nambul river catchment is located in Manipur,North-East India within longitude : 93°45' 6.48" E to 93°52'56.88" E and latitude : 24°35'59.28"N to 24°58'15.6"N with an area of 223 sq.km. (approx). The study was conducted at two selected sites of Nambul riparian zone, one at the upstream and the other at the downstream. The water analyses reveal that the pH of the river water tends to increase towards the downstream site. Low DO at the downstream may be due to heavy influx of organic waste types, domestic effluents, erosional activities resulting from riparian land uses. Throughout the study period upstream showed lower values whereas the downstream indicated higher values of free CO_2. Chloride content of Nambulriver was also found to be below the permissible limit of WHO which is 200 mg/l.

The water quality of Nambulriver reflected that the varying concentrations of various 175ptimi-chemical parameters might be the influence of riparian landuse patterns. Studies reveal that the vegetation along the riparian strip has the potential to absorb at least certain elements in run-off water and thereby buffer or protect the river from non-point source pollution.

Keywords: Water analysis, upstream, down stream, riparian landuse pattern

P76: Green Building Technology to Move Towards

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Demand for natural resources to meet human needs has increased exponentially in recent decades, leading to overuse and exploitation of natural resources and ecological imbalance. In some sectors the change has reached an irreversible level. Construction activities account for half of all energy consumption and raw material consumption worldwide. Commercial and residential buildings account for about 40% of energy consumption, 76% of electricity consumption and 50% of water consumption. If this situation continues, the ability of the global ecosystem to sustain future generations may become a problem. Building construction accounts for the lion's share of resource consumption and major waste generation is from domestic activities. The use of certain non-recyclable materials has posed serious environmental and health problems. Hence the concept of green building has evolved. It is for the welfare of people including stake holders, workers, site staff and general public. The main concept is effective use of various natural resources, protecting the health of the inhabitants, reducing waste products and degradation of environmental quality. Different organizations have developed different technologies and evaluation criteria for green building construction. The government has rolled out several support schemes to encourage such technologies to move towards sustainability.

Keywords: Green building, sustainability, reuse, recycle, conservation, eco-friendly, ecosystem, health, assessment, rating, certification.

P77: An Analysis of Nesting Ground Survey of Olive Ridley (Sea Turtle) using GIS and GPS in Nagapattinam District, Tamilnadu

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The Olive Ridley Sea turtle (Lepidochelys Olivacea) also known as the Pacific Ridley Sea turtle, is a medium-sized species of sea turtle found in warm and tropical waters, primarily in the Pacific and Indian Oceans.The Olive Ridley species is declining primarily due to human activities, including the direct harvest of adults and eggs, incidental capture in commercial fisheries, and loss of nesting habitat. Olive Ridley is in endangered list. It requires the conservation to maintain its survival in the earth. This project highlights the importance of Olive Ridley nesting in the Nagapattinam coast by using GIS. GIS is mapping and analyse tool which is applicable to study the nesting ground of Olive Ridley. This is pilot project in Tamilnadu to use the GIS in the nesting ground study of sea turtle. This study would bring out the reality of nesting season and ground in the study area.

This paper attempted to study the nesting ground and mapped the nesting ground in the Nagapattinam district coast of Tamilnadu. This project is aimed to study the Nagapattinam District coast which is attracting the Olive Ridley for nesting. This coast is located in the centre part of Tamilnadu coast. It is joining place of Bay of Bengal in the east and Palk Strait in south. It is good location for nesting of sea turtles. The entire Nagappattinam district coast line covered three forest ranges namely Sirkazhi, Nagapattinam and Vedaranyam. These three forest ranges involved the Olive Ridley turtle egg collection under the turtle conservation programme. The turtle's egg collected all along the coastal line. Detection of nest in the wild was carried out by tracing turtle tracks and probing the soil. Nests were found during month end of December to March. The nesting sites were marked with GPS on the beach. After collecting the eggs from the wild, they were buried in the hatchery clutch-wise and their progress was monitored on a daily basis. The normal incubation period on an Olive Ridley egg is 50-60 days. The average weight of a hatchling was found to be 18 gm. The hatchlings were released in the sea soon after they had emerged from their nests. Care was taken to release them at the same spots from where the eggs had been collected.

Keywords: Olive Ridley, Nest, Egg, Hatchery, GIS and GPS

P78: Spaced Learning (St) Instructional Approach for Teacher Trainees on Developing Awareness Towards the Enivronment

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The aim is to make individuals aware of the importance of nature and everything that encompasses it. In this regard, Teacher training institutions are the perfect place to begin environmental education. Likewise, teachers play a huge role in creating environmental awareness amongst kids and nurturing the new generation for more respect and responsible behavior towards the environment. Science education is to be inclusive and to improve students' learning achievements, and then we must identify teaching methodologies that are appropriate for teaching and learning specific knowledge. Many authors still appear to believe that schools are failing to prepare students adequately in Environmental education. Spaced Learning helps the students to store the information in the memory for a longer period of time. Therefore, it is suitable to teach environmental studies for student teachers.

Keywords: Spaced Learning, Student-teachers, Awareness and Environment

P79: Community Structure of Scleractinian Corals in Atolls of Lakshadweep Archipelago

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Lakshadweep archipelago is one of the central significance of marine ecosystem and also has the unique features of having atoll reefs found in India. Lakshadweep atolls are one of the least researched coral reef systems in the Arabian Sea, very few studies have been conducted in these islands are still untouched by the Researchers. The objective of this paper was carried out to establish a broader understanding on the community structure of scleractinian corals in atolls of Lakshadweep archipelago to create a comparative baseline data to assess the potential changing trends of the species community in respect to future natural and anthropogenic consequences to the reefs of Lakshadweep atolls.The community structure of scleractinian corals was analyzed during 2015-2020 in 12 atolls by using Line intercept transact technique with the help of snorkeling and SCUBA in different geomorphological zones of the coral reef. The result showed that the zone wise comparative analysis of benthic substratum shows significant differences in between regions and also genus/species distribution of live coral. The Kavaratti atoll showed high live coral species percentage cover with 21.34 % and lowest in Androt island with 4.53% as well as high species richness was observed in Kavaratti atoll (63 species) while the lowest coral richness found in Androt reef about 22 species. The highest distribution of live coral cover occurred at the outer reef slope with 17.90 % and least contribution found in intermediate lagoon (9.77%). The comprehensive dataset developed in this study will provide baseline information on the present status of the reef of Lakshadweep archipelago. Moreover, we hope that this data will help for implementing the meaningful step for suitable management strategies for the conservation and development of coral ecosystem of these fragile atolls for future developments.

Keywords: Lakshadweep, Coral reef, Atoll, Geomorphological zone.

P80: Development of Fungal Adsorbent for Bioremediation of Toxic Metal Ions From Industrial Effluent

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Heavy metal pollution resulting from industrial effluents has become one of the most alarming environmental problems today. Yeast biomass was developed into magnetized bisorbent by treating it with 0.1 M H2SO4 and 0.1 N NaOH, after that mixing with magnetite powder. The immobilization of this magnetized biosorbent was carried out in Ca-alginate matrix and its capacity to adsorb Cr (VI) ions was investigated. An assessment of the isotherm equilibrium model, as well as kinetics was performed. The effect of several parameters, such as biosorbent dosage, contact time, initial metal ion concentration, pH and temperature on biosorption process was evaluated. The value of a, b (Langmuir constants), RL (separation factor) and 1/n (adsorption intensity) revealed the favorable nature of biosorption process. Thermodynamic parameters including change of free energy (ΔG) was determined. The results show that the biosorption process of Cr (VI) ions by immobilized biosorbent was feasible, spontaneous and exothermic under studied conditions. Equilibrium was well described by Langmuir and Freundlich isotherms and rate kinetics was found to follow pseudo-second order type biosorption kinetics. The biosorbed metals were completely desorbed from the biosorbent by elution and biosorbent can be reused for, five consecutive biosorption/desorption cycles without apparent loss of efficiency. The changes in the functional groups and the surface properties of pre- treated and post-treated yeast biosorbent were confirmed by FTIR spectra.

Keywords- yeast, adsorbent, Biosorption, immobilization, adsorption isotherm

P81: Empowering Rural Women of Tilonia Village for Sustainable Development

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The goal of this study is to examine how rural women in Tilonia Community prepared for a sustainable village by learning science and technology. This paper includes a descriptive research whose data were gathered 179ptimize179 a questionnaire from 50 resident women of Tilonia village to understand them and their stories. Water, solar, environment, health, education, communication, and livelihoods are just a few of the areas where Women of Tilonia operate. They serve as an excellent example of how empowering women promotes sustainability as they have made significant progress. The results of this study showed that the womens with low levels of literacy can nonetheless influence social change and also if we empower women, we can accomplish the Sustainable Development Goals more swiftly. Women from disadvantaged origins are now 179ptimize179i in their communities.

Keywords : Tilonia, Empowered women, Sustainable villages, Science Training, Sustainable development

P82: Application of Nanotechnology in Agriculture Management and Climate Control

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Human life is profoundly impacted by the paradigm shift in climate pattern. Greenhouse gas emissions are becoming an increasingly pressing issue for the long-term viability of the agriculture sector. The agriculture sector is mostly responsible for the emission of damaging greenhouse gases including methane and nitrous oxide. The agricultural sector is particularly vulnerable to the effects of climate change, but nanotechnology is helping to mitigate these effects by facilitating sustainable agro waste management, increasing the efficiency with which agricultural crops use nitrogen, boosting the output of farms without soil, etc. When it comes to environmentally friendly nanoparticle production, agricultural wastes are a crucial ingredient. Carbon-based greenhouse gases are avoided and carbon sequestration in agricultural fields is facilitated using nanobiochar. Sustainable crop management, including the reduction of soil, water, and air pollution caused by agriculture, is greatly aided by nanotechnology. Zero-till farming, agroforestry, somatic embryogenesis, transgenesis, tissue culture, etc. all benefit greatly from its increased efficiency.

Keywords: Sustainable, Climate pattern, Greenhouse gas emission, Nanotechnology, agricultural waste

P83: Mechanistic Approaches for Phytogenic Selenium Nanoparticles and its Utilization

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Biologically synthesized nanoparticles have several remarkable properties against environmental challenges. Nowadays, biogenic selenium nanoparticles (BseNPs) are gaining much attention because of their economic feasibility and eco-friendly nature. The biomolecules present in the leaf extract act both as reducing and capping agent of BseNPs. Cytoplasmic reductase enzymes namely sulfite and thioredoxin reductasemay be involved in the selenite reduction process in the presence of NADPH or NADH as electron donors during BseNPs synthesis. Characterization (UV-vis and FTIR) spectroscopy was done and later microscopic analysis (SEM, TEM and EDAX) revealed uniform and highly stable particles size. Further studies will be carried out onantimicrobial and photocatalyticactivity for medicine and wastewater treatment respectively.

Keywords: Biogenic; Selenium nanoparticles; Antimicrobial; Photocatalytic; Ecofriendly; Environmental challenges.

P84: Remediation of Polycyclic Aromatic Hydrocarbons Contaminated Soil Using Agarwood Waste Magnetic Biochar

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Polycyclic aromatic hydrocarbons (PAHs) are toxic aromatic organic compounds that can be released from domestic, mobile emissions and some anthropogenic activities. PAHs have contaminated agricultural soil, peatlandand coastal sediments, which is hazardous to human health because they are carcinogenic, immunogenic, mutagenic and teratogenic by nature. Therefore, remediation of PAHs from the soil is a necessary biochemical process.

Thisresearch revealed thesynthesis of agarwood waste magnetic biochar (AMBC) for PAHs remediation. SEM, EDX and FTIR analysis of AMBC reveals the topographical image, elemental composition and functional groups of AMBC.Porous structure and functional groups present on the surface of AMBC helps in accumulation and remediation of PAHs by the ion exchange and catalytic activities are also evaluated further.

Keywords: Polycyclic aromatic hydrocarbons (PAHs); Aromatic compounds; Magnetic biochar; Remediation

P85: In-silico mining of simple sequence repeats (SSRs) inthe chloroplast genome of DendrocalamussikkimensisGamble ex Oliv.

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Bamboos (subfamily Bambusoideae) are fast-growing perennials that are used by billions of people for food and fibre, and also contribute significantly to sustainable development. The present study was carried out to analyze the occurrence and distribution of SSRs in the chloroplast genome ofDendrocalamussikkimensis. The chloroplast genome sequence was retrieved from NCBI in FASTA format and SSRs were analyzed by using MISA perl script. The minimum motif repeat size was set to 10 for mononucleotide, 6 for dinucleotide, 5 for trinucleotide, and 3 each for tetranucleotide, pentanucleotide and hexanucleotide. A total of 42 SSRs were detected of which 7 were present in compound formation. Mononucleotide repeats were the most frequent (64.28 %), followed by tetranucleotides (33.33%) and pentanucleotides. No trinucleotide repeat was observed.

Keywords: Bamboo; SSRs; MISA; Mononucleotide repeats

P86: Studies on Chemical Characterization of Bioactive Compounds with Anolides and with Amine through Mutagenesis in Different Varieties of Ashwagandha Collected from CSIR-CIMAP, Lucknow

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Ashwagandha (Withania somnifera) belongs to family Solanaceaealso called as Indian ginseng.Mother seed stock of Ashwagandha varieties (Procured from CIMAP, Lucknow) are used as material source for chemical mutagenesis through Ethyl Methane Sulfonate treatment, four different seeds of varieties Nimtili 118, Pratap, Cimpusti, and Poshita were treated with different dose of EMS 1%, 0.8%, 0.6%, 0.5%, 0.4% and 0.2%.In seeds of M1 generation plants, HPLC analysis reflects thatNimtili and Poshita varieties have more active ingredients of withanolides and withamine, and finally it ameliorates the quantity of bioactive compounds for pharmaceutical industries.

Keywords: Indian Ginseng; Withania; Mutagenesis; Withanolides; Withamine; Poshita;Cimpusti

P87: Recent Advances of Aloeverain Herbal Medicine and Cosmetics Industries

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Aloe vera plant belonging to the Liliaceae family, has been used for centuries for its health, beauty, medicinal and healing properties. Many studies have proved that A. vera have several of its bioactive components that have anti-oxidant, anti-microbial, anti-inflammatory and even immunomodulatory effects.TraditionallyAloe used to treat many skins disease treatment against diabetes, diarrhea,thinning and falling hair.Aloe has aloe emodin, aloin and anthraquinone found to be relevant to cancer prevention.It is widely used in cosmetics, and pharmaceutical industries to treat many diseases.The present research an effort towards the lab to field applications.

Keywords: Immunomodulatory effect; Emodin; Anthraquinone; Herbal Medicine

Poster Presentation

SYMPOSIUM-II

Environment and infectious Disease

P88: Delineating Naturally Rich Resource Regions (NRRRs) of Kalaburagi district, Karnataka

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Landscape is mosaic of heterogeneous ecosystem with dynamic interactions of biotic and abiotic elements. Naturally Rich Resource Regions (NRRRs) are characterized by distinct bio-geo-climatic, ecological, hydrological, energy, and social factors. Anthropogenic activities have been altering the landscape integrity, resulting in the degradation of natural resources. Kalaburagi is located in the northern Karnataka state dominated by agricultural land and known as the "Toor Bowl" of Karnataka contributing 40% of the production of the state. The district witnessed rapid growth in dal mills, cement, sugar industries, etc. promoting industrial development in response to the State's Industrial policy 2014-19. Supervised machine learning technique – Random Forest (RF) has been used to assess land use dynamics. RF is ensemble of decision trees maintaining multi-variance between decision trees, less sensitive to noise, and reduction of training didn't have a significant effect on the classifier's accuracy. The Spatio-temporal analysis of land use dynamics assessed through space borne sensors reveals the increase in built-up cover from 0.26% (in 1973) to 1.22% (in 2022), due to setting up of MSME units and cement industries. The water bodies have increased from 0.12% (in 1973) to 1.09% (in 2022). Forest cover is declined from 4.02% (in 1973) to 1.52% (in 2022). NRRRs were mapped through aggregated weights of bio-geoclimatic, hydrologic and social factors, which

reveals that 8 grids (5% area) of the Kalaburagi district fell under NRRR1 (highly sensitive), 15 grids (9% area) under NRRR2 (high sensitive), 52 grids (32%) under NRRR3 (moderately sensitive), and the rest under 103 grids (54%) representing NRRR4 (low sensitive). The regions of NRRR1 & 2 need to be safeguarded through appropriate measures of prudent management with the protection of natural resources.

Keywords: Land use dynamics, Machine learning, Naturally Rich Resource Regions (NRRRs)

P89: Role of Natural Compost as Growth Promoters of Edible Mushrooms for Sustainable Agricultural

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Despite their seemingly quick impact on growth of mushrooms, synthetic fertilizers can seriously deplete the nutritional content of foods and cause serious health problems. Considering these adverse effects, the current work focuses over the usage of organic medium as compost with combination of several barns, seed cake, saw dust and egg shells in straw for the growth of edible saprophytic fungi. Two edible mushrooms Agaricus bisporus (J.E. Lange) Imbach and Pleurotus ostreatus (Jacq. Ex fr.) P. Kumm were selected for mass production using organic additives to boost rural economy. The organic mushroom production can play the significant role with of rural-urban continuum of supply chain development to ensure food security and environmental sustainability.

Keywords: Organic; Compost; Saprophytes; Mushrooms; Sustainable etc.

P90: LPG as the Clean Fuel: Determinants under Shyama Prasad Mukherji Rurban Mission at Pryagraj District, Uttar Pradesh

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Several evidences have been put forth wherein, household air pollution in rural areas has been attributed to biomass fuels. This also greatly contributes to increased aggregate carbon emissions and deforestation in developing countries. The present study, therefore, aims to explore the socio-demographic and economic factors that influence a household's probability to switch from firewood to LPG as cleaner fuel in Koraon block of Prayagraj District, Uttar Pradesh under the Shyama Prasad Mukherjee "RURBAN" Mission, an initiative of Government of India. We employed an ordered probit model and descriptive statistics to construct cooking patterns and fuel choices. The results unfold that higher literacy holds a significant positive response towards the adoption of LPG. The findings, therefore, have significant implications for fine tuning of policies and institutions towards cleaner energy transition in rural India.

Keywords: LPG, Rurban, Probit, Cleaner energy

P91: Assessment of Herpetofauna Diversity in Western Terai Arc Landscape, Uttarakhand, India

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Enlisted among the 200 important areas for biodiversity in the world, the Terai Arc Landscape is a highly bio diverse region of India. It is spread in the Himalayan foot plains of India and Nepal. In Indian Terai Arc Landscape eight wildlife protected areas are situated, while six are situated in Nepal. Total 30000 square km area of Terai Arc Landscape lies in India (Uttarakhand, U.P. and Bihar) and 19500 square km area fall in Nepal. This study was performed in total 593 square km area of western Terai Arc Landscape, known as Ramnagar Forest Division (Uttarakhand). Continuous sampling was done every month, using Visual Encounter Survey method, in 10 different habitat types (6terrestrial and 4 aquatic) between Sep 2016 to Feb 2018. A total of 47 species of herpetofauna (amphibians and reptiles) belonging to three orders, 17 families and 36 genera were recorded in this study, which include 10 species of frogs, 13 species of lizards, 20 species of snakes and 4 species of testudinata. Out of these 47 species, six species were listed in threatened categories of IUCN, and 27 species were protected under Wildlife (Protection) Act, (1972) of India and 11 species were listed in CITES. Among all ten different habitat types studied, the highest species richness (n=32) was recorded from Human settlement and lowest (n=4) from the Pond. Herpetofauna are weather sensitive, poikilothermic creatures and their occurrence pattern changes with the variation in weather conditions. In this study the highest number of herpetofauna species was reported during monsoon season (August), and least number was recorded in winter season (January). The species richness was found highest in monsoon season, which then started reducing in autumns, a rapid fall was observed in pre-winter and finally reached lowest in winter season. The species richness started rising again in springs, continued to rise in summers and reached maximum in monsoons. We found that Ramnagar Forest Division harbours a good diversity of herpetofauna and also home for some important species such as King cobra (Ophiophagus 185ptimi), Burmese python (Python bivittatus), Indian monitor (Varanus bengalensis) and Elongate tortoise (Indotestudo 185ptimize). We hope this study will helpful for further studies in this region and will help in conservation of this ignored group of animals, which play an important role in environment.

Keywords–Amphibians, Reptiles, Wildlife, Visual Encounter Survey, Ecoregion, Habitat type, Species richness, Weather, Poikilothermic.

P92: Bioplastics – A Progressive Approach for Sustainable Environment

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Plastics are an indispensable part of modern society withnumerous everyday applications in a wide range of industries, commerce, packaging and household. The worldwide production of plastics in 2020 has increased by 36% since 2010. New estimates reveal that nearly 1.6 million 186ptim/day of plastic wastes are generated globally due to the COVID-19 pandemic outbreak in the form of single-use surgical facemasks, syringes, gloves, medical gowns,sanitizer containers etc. The efficient decomposition of plastic bags takes about 1000 years. Plastic causes pollution and global warming not only because of increase in the problem of waste disposal and land filling but also release CO_2 and dioxins due to burning. This has generated significant interest in bioplastics to supplement global plastic demands and their management. Bioplastics have several advantages over conventional plastics in terms of biodegradability, low carbon footprint, energy efficiency, versatility, unique mechanical and thermal characteristics, and societal acceptance. This review summarises the advances in bioplastic synthesis, the current status, economic benefits, market scenarios, chemistry and applications of bioplastic polymers.

Keywords: Bioplastics; Biodegradation; Sustainability; Bio economy, analysis of degradation

P93: Water Analysis of Mul Lake in Chandrapur District of Maharashtra, India.

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The 186ptimi-chemical parameters are important for the determination of suitability of water for irrigation, fishing and drinking purpose. Mul lake is a very old lake. Fishermans and fisheries co-operative societies do regular fishing in the lake. Fishes like Catla, Rohu, Mrigal, Clarius batracus, prawns like Macrobrachium rosenbergii, etc. are found in the lake. The present study was carried out for a period of three months from January, 2022 to March, 2022. During the study period, 186ptimi-chemical parameters of the lake were analysed. The mean values of these parameters were found as depth was 7 meters, water temperature was 30 ^{0}C, pH was 7.5, dissolved oxygen was found 4.80 mg/l; free carbon di-oxide was 5.14 mg/l, total alkalinity was 260 mg/l; Electrical conductivity was 0.889 ms; Total dissolved solids was 170 ppm; Calcium hardness was found 3.2 mg/l and Magnesium hardness was 1.6 mg/l. From this study, it may be concluded that, this lake is suitable for aquaculture practices.

Keywords: Water analysis, Mule lake, Chandrapur.

P94: Possibilities and Technologies of Solid Waste Managemnt in Cold Region

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Proper solid waste management is an important activity for any civilized society. Improper management adversely affects human health, environment and ecosystem. SWM is a more complex and challenging task in cold and hilly regions compared to tropical and plain regions, as it affects the process of collection, storage and biological activity, respectively. The increase in tourism and urbanization has led to major challenges of solid waste management in cold regions and urban centers. Lack of proper SWM facilities in some places led to open burning, illegal dumping affecting the ecosystem. This paper emphasizes on reuse and resource recovery methods using waste for energy production as a viable option for sustainable development. Possible improvement of existing SWM practices through revised SWM rules, community participation and promoting initiatives like 'Ban 3 of single use plastic' can eliminate illegal and unhygienic practices and impact on environment.

Keywords- Cold Region, solid waste management, ill effects, ecology, resource recovery, sustainability, waste to energy

P95: Medicinal Significant Herbs of Sri Krishna Devaraya College of Horticultural Sciences, Anantapuramu, Andhra Pradesh, India.

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The aim of this study was to record traditional medicinal uses of weed flora of crop fields of Sri Krishna Devaraya College of Horticultural Sciences, Anantapuramu district during the year 2022-2023. It was the first attempt to understand the importance of weeds with special reference to their medicinal uses in this area. Study was conducted all weeds plants information on use of common weeds found in the fields. Total of 88 Species 68 Genera 23 Families were recorded. Total 88 weed species like Acanthospermum hispidam,Achyranthus aspera, Aerva javanica,Aerva lanta, Alternanthera sessilis, Alternanthera pungense, Amaranthus graecizans, Blepharis maderaspatensis, Boerhaavia erecta, Boerhaavia diffusa, Chloris barbata, Cleome 188ptimiz,Commelina beghalensis, Cymbopogan citrates, Cymbopogon caesius,Cyperus rotendus, dactyloctenium aegyptium, Datura innoxia, Dichanthium annulatam, Digitaria sanguinalis, Euphorbia hirta, Euphorbia thymifolia, Euphorbia heterophylla, Euphorbia indica, Evolvulus alsinoides, Gomphrena serrata, Gomphrena celosioides, Hybanthus enneaspermus, Indigofera linnae, Indigofera thymifolia, Indigofera cordifolia, Justicia glauca, Lactuca runcinata,Leucas aspera, Mullugo nudicaulis,portulaca oleracea, Oldenlandia 188ptimize188, Parthinium hysterophrous, Pavonia zeylanica,Pedalium murex, Physalis minima, Phyllanthus maderaspatensis, Oldenlandia 188ptimize188,Ocimum americanam, Tephrosia purpurea, Tribulus terrestris, Sida acuta and waltheria indica etc. Were documented having medicinally important and are being used by the local people for treating their various diseases like cough, fever, Jaundice, headache, Stomachache, 188ptimize, dysentery, piles, asthma, kidney stones, etc. Leaf, fruit, stem bark, flower, root and whole plants were used to cure their health problems. The information was collected from the Yanadi tribes, It was found that the area is rich in indigenous knowledge associated to weeds but still there is large number of underutilized weeds which could not prove useful yet. It is suggested that such type of studies should be carried out in future on utilization and conservation of indigenous knowledge of weeds.

Keywords: Medicinal weeds, SKCHS Campus.

P96: Sustainability at Construction Projects – Indian Perspective

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Across the globe, construction industry is one of the largest consumer of global resources and major contributor to the pollution. In consideration to the importance of natural resources and environmental impact of construction activities, there is an urgent need to incorporate sustainable practice into the traditional construction. Adoption of sustainable design, engineering and construction practices, usage of modern technologies like BIM, conservation of natural resources and energy, optimization of material usage and proper management of construction waste are some of the steps that can be taken to ensure responsible and sustainable construction at construction project sites.

Keywords: Natural resources, Construction waste, Sustainability, Reuse & Recycling

P97: "Salvadora Oleoides and Economic Importance with Special References to Thar Desert"

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It is a small tree with drooping branches, rarely with proper bole or exceeding a height of 20 feet and a girth of 3 feet. It is very common plant in arid tracts but becomes scarce where rainfall conditions are better. It can withstand great soil salinity. It produces new leaves during April, which on maturity become thick and leathery.

The tree coppices fairly well but regenerates freely by root suckers and natural layering. It is, however, very slow growing but a dense growth is often formed around the parent plant by root suckers and some natural seedlings. The plant provides a dense shade. It is often lopped for camel and goat fodder.

Small greenish white flowers are produced in March–April. The fruit is yellow and ripens in the months of May and June. It forms one of the main grazing sources for livestock owned by local farmers. It is often dried and preserved in large quantities. The seeds are spread by birds. The seedlings come up under the parent plant or under other bushes and are somewhat frost-tender.

The Jaal is commonly found in and around Thar desert specially Barmer district and is reserved for use as grazing sources for local peasant villages. In addition, a number of trees have been preserved to provide shade for cattle.

The Jaal is mostly non-woody and the small amount of wood that it has is soft, light, and not particularly useful for any of wood's normal uses, notably building and heat. When burnt, it leaves a large quantity of ash, which can then be boiled down into a substance for treating mange in camels.

Keywords: Drooping branches, Root suckers, Natural layering,Non-woody,Livestock.

P98: Bioefficacy of Nishinda (Vitex Negundo) Leaf and Garlic (Allium Sativum) Bulb Extract Against Red Spider Mite, Oligonychus Coffeae in Tea Plantations Of Darjeeling Hill, West Bengal, India

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The red spider mite, Oligonychus coffeae (Nietner) causes huge damage to the Darjeeling tea plantations reducing the quality of the leaves. Different plant extracts are presently used as an alternative to the chemical pesticides to control the red spider mites. In the present study, the leaves of Vitex negundo L. and the bulb of Allium sativum L. were assessed for their acaricidal property on the larval, nymphal and adult stages of the mite. Both the extracts were reported to have potential to control red spider mites and can be used as potent acaricides in near future.

Keywords: Darjeeling, Garlic bulb extract, Nishinda leaf extract, Oligonychus coffeae, Tea

P99: Sexual Variation in DNA Content of Heteropneustesfossilis

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The present study was conducted on DNA extraction and DNA quantification of both male and femaleHeteropneustesfossiliscollected fromthree different sites of Bijnor district (U.P.), India.On the basis of morphometry, identification keys and standard literature fish were identified. DNA extractionand gel electrophoresis were carried out. Extracted DNA was analyzed using Nanophotometerto determine the quantity of DNA and its purity level. The DNA content of Heteropneustesfossilisfemale was 51-70 ng/µland of male was 60-73 ng/µl at site 1, the DNA content of female Heteropneustesfossiliswas 51-65 ng/µland of male was 63-77 ng/µl at site 2;the DNA content of female Heteropneustesfossiliswas 65-79 ng/µland of male was 75-78 ng/µlat site 3. The results revealed that the highest content was seen in cultured fish. For further analyses few samples were collected and brought to the laboratory to determine seasonal variation. The study also revealed that the highest content was seen during their breeding season and in monsoon especially during the month of June- August.

Keywords: DNA extraction, DNA quantification, Nanophotometer, Heteropneustes fossilis, Morphometry.

P100: Potential of Regeneration Status of Dominant Species in Teak – Dipterocarpus Forest of Manipur

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Natural regeneration status of forest stand could be the key to restoring the world's forests. The present work emphasize on the natural regeneration pattern and distribution of dominant tree species in two forest sites of the Teak Dipterocarpus forests along the Indo-Myanmar border (94°15'E to 94°20'E longitudes and 24°15'N to 24°25'N). Forest site I is located interior in the forest and site II is located at the periphery near the human settlement. Natural Regeneration Ratio, between adults and seedlings+ saplings, was determined in both the study sites during monsoon and post monsoon seasons for tree species. The process of natural regeneration of the forest site I during the monsoon was higher (Natural Regeneration Ratio 1:5.49) as compared to that in the post monsoon season (Natural Regeneration Ratio 1:3.54). In study site II the ratio in both the seasons was comparatively low (1:4.21) and 1:2.73) respectively). Success of natural regeneration depends on establishment of tree, seedlings and saplings in the micro-environment of their habitats along with interactive influence of biotic factors. The present study on regeneration of forests has implications for the management of forests, conserve biodiversity, tackle climate change and to ensure maintenance of the community structure and ecosystem stability.

Keywords: Restoration, Regeneration Ratio, Seedlings, Saplings, Biodiversity, Climate Change

P101: Plant Growth Promotional Effect of Piriformospora Indica and Azotobacter Chroococcum on Plant Yeild

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India is aagronomically dominant country with agriculture being the primary source of livelihood of 58% (approximately) of its population. Sustainable agriculture is a big challenge and its success lies in new approach to accomplish the goals of growing crops without destroying the environment. The most natural way to adapt sustainable development is by improving the quality of soil by using microbes. The microbial community can provide useful practices for the conservation of soil and enhancing crop productivity. In ecosystem , all microbes interact with each other intimately and microbial communities in rhizosphere form associations with each other and a basis of a cumulative impact on plant growth. Piriformospora indica and Azotobacter chroococcum are well known rhizospheric microorganisms known for their beneficial interaction with plants, which makes coinoculation of crops with them, most promising inrelation to sustainable agriculture.The synergistic interaction between Piriformospora indicaandAzotobacterchroococcum hold potential in improving the extent of nutrient acquisition by plants from the soil to enhance crop productivity, overall growth performances in vegetative and reproductive stage resulting in increased NPK content.This combination improves plant biomass and the use of this microbial consortium as bio-fertilizer in place of chemical fertilizers hence, presents a viable option for increased yield of plant .

Keywords: Sustainable Agriculture, rhizosphere, plant growth, synergistic, NPK

P102: Studies on Health Status of Fluorosis Affected Inhabitants in Some Specific Villages of Rajauli

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The intake of fluoride rich water above the maximum permissible limit of 1.5 mg/L leads to a disease called fluorosis. Rajauli block of Nawada district, Bihar is one of the worst fluorosis endemic areas. Inhabitants suffering from dental, skeletal and non-skeletal fluorosis have been found in the villages of Rajauli block. A total of 44 samples from different water sources of Hardia Sector D, Singar Khas, Hanuman Nagar and Bhaunr were analysed by the Ion Selective Electrode Method at the 'Centre for Fluorosis Research, Department of Chemistry, A.N. College, Patna.' Out of the 44 samples, 41 water samples were contaminated with fluoride. To identify the fluorosis affected people, health status survey was done. The height and weight of the villagers (who were above 6 years of age) were measured and the BMI (Body Mass Index) values were calculated. During the health survey many people of the village reported dental problems, muscular pains, joint pains, bone deformities and many more ailments related to fluorosis. Some cases of knock knee and bow legs were also observed. Many of the inhabitants had their BMI level less than 18.5. In some villages of Rajauli, the use of Moringa oleifera has started giving positive results. The leaves and fruits of Moringa oleifera are consumed by the people as a nutritional supplement and has led to reduction in severity of the disease.

Keywords : fluorosis, endemic, inhabitants, deformities

P103: Indian Spices Used as a Biopreservatives

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In order to meet consumer demand as food and technological advancements continue, biopreservatives are frequently used in food items. Nowadays, people tend to ignore meals that contain chemical preservatives in favors of generally trusted safe items. As a result, the food business uses naturally occurring preservatives to extend product shelf-life without utilizing any new technology. Spices like garlic, turmeric, cumin, cinnamon, bay-leaves, red chili, mustard, fenugreek, coriander, and so on are the most widely utilized bio-preservatives. When introduced at varied quantities, they show growth inhibition of a variety of bacteria, which helps preserve food products. To determine their appropriate use, these preservatives have undergone laboratory testing.

Keynotes- Biopreservatives, shelf-life, fenugreek, cinnamon, inhibition

P104: Species Diversity of Desert Vegetation at Bikaner District of Rajasthan

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Phytosociology is a qualitative study of the structure of the vegetation of a particular area emphasizing quantitative relationship of a few dominant species which control the community and there by the occurrence of a large number of rare species. From the terrestrial ecology point of view the vegetation is an important parameter which gives an insight of the status of Ecosystem. Species diversity is useful to describe the population dynamics of each plant species occurring in a particular community and to understand how they relate to the other species in the same community. Since the vegetation is a key factor in the structure of an ecosystem. The present investigation carried out on different phytosociological aspects of desert plant speciesaround Gajner village of Bikaner District .The Importance value Index (IVI) is used to determine the overall importance of each species in the plant community. Leptadenia pyrotechnica and Calotropis procera showed the maximum IVI values in the study area which reveals that these communities are considered as dominant in the desert ecosystem of Bikaner district. A total of 55 plant species were recorded from the study site in present study, belonging 31 families. Poaceae was dominant family. Species Richness, Diversity and Dominance Indices were calculated using software PAST. The present study is an attempt to provide information on phytosociological aspects to understand the species diversity patterns in desert ecosystem at Gajner village of Bikaner district of Rajasthan.

Keywords: Community, Desert, Ecosystem, IVI Phytosociology Species.

P105: Preparation and Characterization of Starch Nanomaterial for Efficient Adsorption of Heavy Metal ions from Aqueous Solution

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Heavy metal ions are concerned as priority pollutants because of high toxicity and mobility in natural water systems. Therefore, in this study, starch nanomaterial was prepared and used as an effective adsorbent for the removal of Lead and Zinc heavy metal ions from aqueous medium. The prepared starch nanomaterial was characterized by means of XRD, FTIR, PSA, SEM, EDX and TEM analyses. The effect of contact time, initial metal concentration, adsorbent dose and pH on the adsorption performance of starch nanomaterial was investigated thoroughly. The experimental results concluded that better adsorption efficiency was 194ptimize194 at 90 minutes. It was also observed from this study that adsorption efficiency of starch nanomaterial depended upon the initial metal concentration and adsorbent dose. The maximum removal of lead and zinc metal ions onto the surface of starch nanomaterial was achieved at acidic pH. The Langmuir adsorption isotherm model was found to be the best fit model in both the metals.

Keywords: Toxicity, Mobility, Heavy metal, Starch nanomaterial, Zinc, Lead and Adsorption Isotherm

P106: River Water Quality in Relation to Alluvial Deposition and Irreparable Ecological Approach

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Alluvial is a natural and essential component of river systems and play a major role in the hydrological, geo-morphological and ecological functioning of rivers. The interdisciplinary nature of water resources requires the integration of technical, economic, environmental, social and legal aspects into a coherent framework. The present work, seven heavy metals namely Co, Cu, Cr, Ni, Cd, Zn, and Pb were examined on a seasonal basis of fluctuation in 2018–2019 in the river terrain of Ganga in Prayagraj (Allahabad). The heavy metal concentration ranged between 09.37-26.12, 2.16 -09.14, 41.25 -67.08, 13.29 -23.59, 0.19- 0.28, 11.26- 15.59 and 08.71- 11.26 mg/kg for Co, Cu, Cr, Cd, Ni, Zn and Pb, respectively. The highest contamination degree of the sediment was noticed as 5.23. Geo-accumulation index was noted between (0 and 2, class 2) which showed that sediment was contaminated to moderately contaminated and may have adverse affects on freshwater ecology of the river. Pollution load index (PLI) was found highest 01.25 it indicates that the river sediment has a moderate pollution load. The amount of nutrient were dynamically influenced with time periods, water availability, and their flow and pollution load. Various pollution indicators revealed that the river bed sediments is less contaminated by toxic metals during the study, but the alluvial/ sediments occurrence trend in the near future may cause irreparable ecological approach.

Keywords: Hydrological status, river terrain, sediments transport, potential heavy metal, irreparable ecological approach

P107: Conservation of Endangered Species of Butea Monosperma var lutea (Witt) Maheshwari (Yellow Palash)

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Butea monospermavar lutea (Witt) Maheshwarialso known as 'Yellow Palash' or 'Golden Butea' is very rare and endangered species of family Fabaceae. Golden Butea found its use in Ayurvedic, Unaniand Siddha medicine for varying health problems. All the plant parts have varying uses. Golden Buteaisincluded in IUCN Red list of threatened species. Our aim is to revive golden plant by plant biotechnology methods. We have adopted micropropagation and embryo rescue methods of plant tissue culture technique. In vitro multiplication is the best method for rescuing & reintroducing this endangered species in the biodiversity surrounding Nagpur.

Keywords: Yellow Palash, Golden Butea, Micropropagation, Embryo Rescue, In vitro Multiplication, Plant Tissue Culture

P108: Asymbiotic Association of Naemaotes and Bacteria

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Nematodes are among the most abundant and diverse organisms on the planet that have a significant global impact on economies, ecosystems, agriculture, and human health. Nematode-bacterium associations can be beneficial (mutualistic) or harmful (pathogenic/parasitic) and can range from facultative, temporary interactions to stably maintained, long-term symbioses. Bacteria can be a potential food source for nematodes. Bacterivory only occurs in select nematode species and can be non-specific (such as in Caenorhabditis elegans) or specialized. In specialized interactions, the nematodes preferentially depend on select genera or species of bacteria, and these bacteria may be purposefully introduced or raised by the nematode. As well as being a food source, bacteria can be pathogens of nematodes. The bacterial ectosymbionts, Xenorhabdus and Photorhabdus, are closely associated to their host nematodes, Steinernema and Heterorhabditis, respectively, despite their intestinal localization. These symbioses are a good model of co-evolution where four biotic levels have to be investigated: defense reactions of the insect target, nematode pathogenicity, bacterium pathogenicity, and symbionts lysogeny. In addition to trophic and pathogenic interactions, bacteria can serve as mutualists by aiding nematodes in development, defense, reproduction and nutrient acquisition. These nematodes and their bacterial symbionts are now considered a tractable model system that is amenable to study physiological, chemical, structural and developmental aspects of beneficial symbiotic associations. This study presents an overview of the current knowledge that is available on the bacterial symbionts and on the biology the nematode genera.

Keywords: Heterorhabditis, Xenorhabdus, nematodes, bacteria, mutualists, biological control

P109: The Effects of 5g Spectrum to the Environment

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5G is an advanced wireless technology which is designed to improve the higher performance with the super efficiency. Basically 5G is the 5th generation mobile network which comes following 1G, 2G, 3G, 4G and now 5G network. There is no doubt that for a satisfactory user experience, 5G is must. But there is question arise, is 5G harmful to humans and our environment?' Before finding the answer and further conclusion let us view a short description about the spectrum. The electromagnetic spectrum is the range of all types of electromagnetic radiation. The radio spectrum is the part of the spectrum used for telecommunication, broadcast, aircraft communication and more, and ranges from 30 Hz to 300 GHz. The overall spectrum also includes visible light, gamma rays, x-rays, microwaves, etc. Spectrum on the lower end, called low-band (600 MHz to 900 MHz) has longer waves and can travel farther. As waves range from mid-band (2.5 GHz to 4.2 GHz) to high-band— also known as millimeter wave (24 GHz to 47 GHz)—they get shorter and shorter, enabling more bandwidth (the amount of data that can be transmitted in a specific amount of time) but losing the ability to travel as far. While low-band can penetrate walls well, its speed is limited to 100 MB per second (Mbps). Mid-band spectrum speed can reach 1 GB per second (Gbps); it has lower latency than low-band, but it cannot go through buildings as easily. High-band or millimeter wave (mmWave) has very low latency and is superfast, up to 10 Gbps. These high frequency mmWaves also offer increased transmission space so more devices can be connected at once. The drawback is that they are weaker and cannot easily penetrate solids. 5G operates on all three spectrum bands. 5G works by producing a type of energy called electromagnetic radiation. It uses higher frequencies than previous wireless networks, making it faster and more efficient.

Now coming to the point Electromagnetic frequencies, like those produced by 5G, create an area called an electromagnetic field (EMF) since some people believe EMFs have negative health effects like Tissue Heating, Cognitive function, cancer, etc. as EMF is potentially associated with it. Study says that mobile phones use frequencies of 1.8 to 2.2 GHz. These frequencies cause tissue heating, according to WHO. Tissue heating occurs when our skin absorbs electromagnetic energy. This causes a slight rise in temperature in your brain and body. It is also found by study that people experience more EMF-related tissue heating as they get older. Plus,

the higher the EMFs, the more they absorb. That's because older individuals tend to have reduced skin thickness and blood flow. However, tissue heating is considered to be short-term and minimal. The Federal Communications Commission (FCC) also states that the public is exposed to very low frequencies of EMFs. These levels are too low to cause considerable tissue heating. But more research is necessary to determine how 5G specifically affects human tissue. There are several studies regarding EMFs and cognitive function. They concluded that there is no solid link between EMFs and cognitive concerns. In

2011, the International Agency for Research on Cancer (IARC) stated EMFs are "possibly carcinogenic" to humans. The classification was determined by 30 scientists from 14 countries. To date, most studies have examined the potential link between EMFs and brain cancer. But the results have been inconsistent. It has been found that EMF radiation from mobile phones are associated with glioma, a type of brain cancer. Some study on the other hand, did not find a clear association between high frequency EMFs and brain tumors. Again, more studies are needed to determine if 5G frequency can contribute to cancer development. But there's limited research on how 5G specifically affects animals. We may conclude our statement by saying that there is not any proved study which can confirm that 5G spectrum is harmful to the environment. Currently, there's no solid evidence that 5G causes negative health effects in humans or animals. Most researchers have studied EMFs in general and found mixed results but further research on this field is necessary.

Keywords: 5G, Spectrum, EMF, Network, Bands, Research

P110: An Assessment of Primary Productivity of River Karamnasa at Buxar, Bihar

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The present investigation describes the status of primary productivity of river Karamnasaunder the influence of itsphysico-chemical characteristics at Buxar, Bihar. For this purpose, various 198ptimi-chemical parameters like water temperature, turbidity, DO, free CO_2, total alkalinity, nitrate and phosphate were calculated and noticed the impact of these parameters on primary productivity from March 2021 to February 2022. The obtained resultshowed that the primary productivity of river Karamnasai.e, GPP, NPP and CR were closely related with 198ptimi-chemical parameters. The primary productivity of river Karamnasaalso showed a Bimodal peak, one peak during summer season and another peak during monsoon months.

Keywords: Primary Productivity, Physico-Chemical Parameters, River Karamnasa, Buxar, Bihar.

P111: Environmental Factors Like Air Pollution and Allergens in Rising Allergic Respiratory Diseases

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Worldwide the respiratory allergic diseases (rhinitis and bronchial asthma) are increasing day by day. Many factors such as air pollution, green house gases, genetic factor, climate change, allergens etc are responsible for it. Laboratory report confirm the epidemiological evidence that inhalation of some pollutants either individually or in combination, adversely affect lung function in asthmatics. Air pollutants may increase the frequency and may promote airway sensitization to airborne allergens in predisposed subjects. In high tech cities pollution from vehicle is major factor responsible for it. Air pollution, (green house gases) increases temperature on earth which is unbearable for asthmatic & allergic patient. Due to climate change allergens response also changes, during this time phase patient suffer from short breathing. Genetic factor is also another responsible for it.

Keywords: Asthma, air pollution, genetic factor, climatic change, aeroallergens, allergens

P112: Water Pollution

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Water pollution has become a major issue all over the nation now a days as we can see from the researches, lots of water bodies are getting polluted due to release of waste material from the industries or societies in the river bodies without any treatment. This has become a major environmental issue for India as its 70% of surface water has been polluted by various pollutants (bio-wastes, chemicals, garbage etc..). According to the World Bank report such releases of pollutants in the up streams reduces the economic growth in the downstream areas, which reduces the growth of GDP in these regions which create a downward impact on the overall GDP of the country. Almost half of the GDP is lost. Due to the polluted stretches in India the agricultural revenues decreases to 9% and also a 16% fall in agricultural yields in downstream areas. Some remedial measures should be taken to protect the poor masses of the country. Waste ingredients should not be disposed in oceans, rivers, lakes and ground water or any other water bodies. Controlled use of pesticides and fertilizers should be done as this will also prevent deposition of the in convenient material into nearby water bodies. Clean water bodies will result in the sustained development of the. It is the dire need to control water pollution to achieve the vision of the 'Healthy nation'.

P113: Effect of Soil Contamination on Human Health

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Soil has a considerable effect on human health in the form of positive or negative, direct or indirect. Soil is an important source of nutrients in our food supply and medicines such as antibiotics. However, nutrient imbalances and the presence of human pathogens in the soil biological community can cause negative effects on health. Soil contamination is an alarming situation that needs to be addressed for a healthy lifestyle. Soil is commonly contaminated by industrial activity, agricultural activity, and improper waste disposal as well as accidental spill and acid rains amongst them industrial activity has been the biggest contributor due to constant increase in mining and manufacturing, and a lack of understanding of the possible impacts of industrial activity on the environment as well as heavy metal smelting, service station, and fuel depot operations, gas work operations, timber milling, chemical production, and power plant operations. An increase in the use of pesticides and modern fertilizers that are full of chemicals that cannot be broken down naturally has had tremendous implications on the health and fertility of our soil as well as to human beings also. Potentially harmful pesticides and herbicides have historically been used on a number of different properties, ranging from low-density residential blocks to large-scale crop operations (such as banana plantations and market gardens). The leaching of harmful toxic chemicals present in fertilizers and pesticides leads to grounds water pollution. Our bodies are filled with toxins from our food and now, much of our personal waste (urine and feces) is making its way into our landfills, adding to the pollution of our soil. India generates about 50 million 200ptim of municipal solid wastes (MSW) every year from cities containing significant heavy metals. About 9-10% of these wastes find their way into agricultural land in the form of compost contaminated with heavy metals. Soils irrigated with sewage water for 20 years resulted in a significant buildup of DTPA extractable Zn(2.1times), Cu (1.7 times), Fe (1.7 times), Ni (63%), and Pb(29%) in sewage–irrigated soils over adjacent tube well water-irrigated soils. Heavy metal toxicity can lower energy levels and damage the functioning of the brain, lungs, kidneys, liver, blood composition, and other important organs in humans. Less commonly, accidental chemical spills and acid rain can contaminate and change the structure of our soil. About 11 MHA of arable land suffers from acute soil acidity (ph<5.5) with very low productivity thereby affecting nutritional security. The appropriate handling, transport, and disposal of waste is a

critical component in reducing the potential impacts of waste on human health and the environment. In order to fully understand the extent and nature of soil contamination at a site, and to design a suitable remediation strategy, a site investigation program by a qualified consultant will typically be required as a first step.

P114: Spices Used for Food Safety and Bio-preservation

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Since ancient time people have used spices. Spices are plant components that are utilized because of their qualities, and employed as flavourings, preservatives, and medicines. In terms of preventing and treating a wide range of illnesses, including cancer, ageing, metabolic, neurological, cardiovascular, and inflammatory diseases, spices have demonstrated a number of health benefits. Since spices contain chemical substances like alkaloids, terpenoids, flavonoids, and tannins, their benefits have been known for a very long time, and interest in the potential of spices is amazing. A number of spices, including cumin (cuminaldehyde), black pepper (piperine), and turmeric (curcumin), among others, are known and investigated for their antibacterial and antioxidant capabilities because of their primary chemical components. Numerous pathogenic and spoilage microbiota can infect food products; the former can result in food-borne illnesses, while the latter can result in large financial losses for the food industry due to unfavorable impacts on the qualities of the food. While they have been mainly used as flavoring and coloring agents, their role in food safety and preservation has also been under investigation in vitro.

Keywords: Alkaloids, Terpenoids, Flavonoids, Cuminaldehyde, Curcumin, Piperine, Microbiota.

P115: Plastic and Environment

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The production of plastic has overtaken almost every material of production because the use of plastic goes wide. Shockingly after the used of plastic some plastic material thrown away after single use. The overcome of this action is that the waste from plastic covered half of the world. Asia is generated most of the waste other than America, japan and European Union are the biggest producer per capita till now. The most of the single-use of plastic found in cigarette butts, plastic drinking bottles, plastic bottles and grocery sector. Even in corona virus pandemic rush for plastic has sparked. From Wuhan to New York and in India demand of face shields and gloves, food container and bubble wrap, so waste has created. This time world is facing global plastics crisis. Out of the 8.3 billion tons of plastic produced since 1950s. And large amount of plastic waste ended in landfill at least 79% leaked into the environment. There is no place on earth which is untouched by plastic. Now the scientist have suggested that if it is not stop there it could be serve as geological indicator of Anthropogenic era.

Keywords: Plastic, COVID-19, Environment, Pandemic.

P116: Management of Municipal Solid Waste (MSW)

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The environmental problem arising from unscientific indiscriminate disposal of Municipal Solid Waste (MSW) but not only MSW the waste from energy plants, sludge from ETP plants and slit drains. These wastes mixed up with MSW and leading many problems. The utilization of waste used in building sector as ecofriendly building sector through this the pollution and health gets reduced. The MSW is utilized as a fuel in industries but the waste ashes from the industries are in environment as waste and creating pollution. The waste-toenergy ashes are inert material which was non-usable. But now it has been proved that ashes could be utilized completely in development of eco-friendly building materials. In this investigation deals with utilization of ashes generated from WTE plants to develop value added building Materials. Feasibility studies have been carried out WTE ashes like: fly ash and bottom ash partially replacement of fine aggregates to construct paving blocks for road construction. OPC cement was used as binding materials in all the studies. After using these ashes as fine aggregates the result was observed that material has high compressive strength to develop the products. The developed paving blocks were tested as per Indian Standard and results received were complying with standard requirements. Using this 30-50% of WTE ashes as fine aggregate have ability and strength so we can develop and may use for low cost construction. Toxicity test (TCLP) was also performed as per USEPA procedure and it has no leaching of toxic metals. All the heavy metals were deactivating after curing of 28 days. Keywords:Paving Blocks, Toxicity Test, Fly Ash, Bottom Ash

P117: Environmental Infection and its Guidelines

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The environment sets itself as a habitat of a vast variety of microorganisms, that may be pathogenic and may not be. It serves as a passage for transmission, which makes immunosuppressed mankind suffer. In the current scenario, environmental infection has reached its peak. Microbes 202ptimize202io in the environment are mostly bioaerosols or nosocomial infectants which leads to any respiratory disorder majorly and skin diseases because the skin is the largest organ and priorly comes in contact. Surviving in the covid era we've learned some sophisticated terms like sanitization, infection, prevention, etc. Covid was like a monster that engulfed one-fourth of the population through its hazardous infection and strong transmission from human to human. Lack of establishment of proper guidelines and safety measures the contagion became brawny. Several guidance and preventive measures have been adhered to for mankind by the world health organization (WHO).

Keywords: Microorganisms, Nosocomial infection, Covid, hazardous, WHO

P118: Bioremediation- An Overview

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Bioremediation is a promising approach to improve our ongoing environmental issues, thereby limited understanding of microbes' contribution to the effect of bioremediation and its impact on the ecosystem has been an obstacle to making the technology more reliable and safer. Such microbial treatment is used to clean up the contamination in water, soil, sledges, waste streams and other land pollutions. Bioremediation is a very effective way to clean our environment with the help of microorganisms such as bacteria like –Pseudomonas putida, Dechloromonas acromatica, Methylibium petroleiphilum; fungi like- Phanerochaete chrysosporium. These microbes act as Amendments to the environment. The Amendments optimize the unfavourable conditions to favourable ones to accelerate the bioremediation process. This process requires a combination of the right temperature, nutrients and food, the absence of such components may prolong the clean-up. It takes several months to several years to degrade, depending on the sizes, contaminants, and areas for degradation. It's further divided into two forms first ex-situ and in-situ. In ex-situ – Removal of wastewater and collection at a place to facilitate the growth of microbes. In-situ – there is no need for the removal of soil or water, a supply of oxygen and nutrients is needed, and microbes degrade the chemicals. Some examples of bioremediation technologies are bioventing, land farming, bioreactor, compositing, bioaugmentation, bio piles, composting and bio-stimulation like – Rhodococcus and Mycobacterium. The micro organism which performs the function of bioremediation is known as Bioremediation.

Keywords: Environmental, microbes, amendments, degradation, Pseudomonas putida, Mycobacterium.

P119: Environmental Pollution Challenges and Possible Remediation

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Rapid Urbanization and technological advancement in motor vehicles increase its growth drastically effect human life and environment. Environmental pollution is the alteration of our natural environment by the introduction of unfavourable and harmful substance. These harmful substances are called pollutants. Pollutants are of many types. They can be natural like volcanic ash or can be created by humans such as trash or runoff produced by factories. They can be chemical or geochemical. These pollutants in any form has deteriorated the quality of our environment. Environmental pollution is a global problem, that attracts the attention of human beings for life threatening consequences. Some of the evidences for the environmental pollution are loss of biological diversity, vegetation, increased amount of harmful chemicals in the ambient environment. These are intentionally or unintentionally are released by man that cause direct on indirect impact on our surroundings. Pollutants damage the quality of air, water, and land. Many things that are useful for people produce pollution. Cars spew pollutants from their exhaust pipes. Burning coal releases harmful gases. All these factors cause air pollution that has direct impact on our health. Urban air pollution in the form of CO, SO_2, NO_2, PM (Particulate Matter) and RSPM (Respirable Suspended Particulate Matter) in many cities of India are extremely high. Many Pollutants are responsible for causing major disease in humans. Major share to environmental pollution (approx 70%) is contributed by Transport and amongst them CO is the major pollutant releasing from transport sector contributing to emission of 90%. Next to CO is the hydrocarbons contributing to less as 3-5%, most of the SPM (Suspended Particulate Matter) are generated due to the re-suspension of dust out of which PM10 is the most prominent air pollutant. Nox is another important air quality indicator. Air pollution is a significant risk factor for a number of pollution related diseases like respiratory infections, heart disease, anxiety, COPD, stroke and lung cancer. Industries and homes generate garbage and sewage causing land and water pollution. Water pollution is the contamination of water bodies, usually as a result of human activities, so that it negatively affects its uses. Water pollution is the contamination of water bodies, usually as a result of human activities, so that it affects its uses negatively. Water pollution has disturbed the aquatic and marine life

to a large extent. The problem of pollution cannot be resolved by conventional tools and traditional strategies. Phytoremediation is a cost-effective, ecofriendly, affordable and nonintrusive solution to remove different types of pollutants from contaminated water and soil.

Keywords: Environment, pollution, global problem, pollutants, heart disease, anxiety, solution.

P120: Microbial Degradation of Pesticides a-state-of-art

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Pesticides play an important role in preventing insect pests and weeds in crops However the excessive use is serious threat to human beings (due to its toxicity). Various approaches have been implicated to reduce pesticides like been physical, chemical, biological and enzymatic. Due to cost effective and thermodynamicallymore affordable, microbial pesticide remediation is ore curiously used. Microbes under favourable conditions have been reported to use pesticides as a source of carbon, sulphur and electron donor. Remove or detoxify of chlorinated pesticides have been done by bacteria, actinomycetes and fungi. The extensive use of pesticide imbalance the properties of soil, water and air environments. Only combined microbial consortia of indigenous and naturally occurring microbes isolated from particular contaminated environment have ability to degrade pesticides at faster rate. Major bacterial and fungi genera includes; Bacillus, Pseudomonas, Flavobacterium, Moraxalla, Acinetobacter, Arthrobacter, Paracoccus, Aerobacter, Alkaligens, Burkholderia and Sphingomonas, Fusarium, Aspergilus niger, Penicillium, Lentinulaedodes, Lecanicillium, Oxysporum. In this review, we discuss the recent challenge of pesticide problem in soil environment and their biodegradation with the help of degrading microorganisms.

Keywords: Pesticides, Microbes, Detoxify, Bacillus, Fusarium, Aspergilus niger

P121: Study of Acinetobacter in Clinical Samples, Antibiotic Sensitivity Pattern with Reference to Metallo-B-Lactamase

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Introduction: ß- Lactamase production is the most important mechanism of acquired ßlactam resistance in gram-negative pathogens. Acinetobacterbaumannii has emerged as an important nosocomial pathogen in outbreaks of hospital infections and is ranked second after Pseudomonas aeruginosa among nosocomial pathogens of aerobic nonfermentative gramnegative bacilli.Metallo-β-lactamases (MBLs) are enzymes with versatile hydrolytic capabilities, namely the ability to hydrolyse all β-lactam antibiotics, with the exception of monobactams.Methods: 100 Imipenem and Meropenem resistant Acinetobacter species were investigated for MBL production by Disc Potentiation test, Double Disc Synergy test and Extended Disc Synergy test. Results & Discussion: Out of 100 Acinetobacter spp. Isolated the highest percentage of MBL positive were given by the EDST (64.29%) method, followed by the DP (47.62%) and then the DDST (31%) method. Conclusion: The highest no. of Acinetobacter species were isoltad from hospitalized patients than non-hospitalized. EDST is the best method for the detection of the MBL production in Carbepenem resistant strains.

Keywords: Metallo-β-Lactamase, Acinetobacter species, Imepenem, Meropenem.

P122: Genetic Diversity Analysis of Alternaria 206ptimize206 Isolates Infecting Different Crops Using URP and ISSR Markers

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Alternaria 206ptimize206 is a well known and economically important seed-borne pathogen with a very wide host range. Thirty-eight isolates derived from various hosts from different geographical regions in India including a few exotic isolates from Taiwan, Syria and Argentina were used in the study. The molecular characterization using two marker systems i.e. universal rice primers (URP) and inter simple sequence repeat (ISSR) was carried out, which revealed differences based on geographical origin of various A. 206ptimize206 isolates, which otherwise could not be revealed through conventional characterization. Out of 13 URPs and 20 ISSR primers screened, 5 primers from each marker gave very good reproducible banding patterns. Polymorphism bands ranged between 88.1–100.0% in URPPCR, whereas it was 100% in case of ISSR-PCR. Maximum heterozygosity (Hn) was revealed by URP 2F and URP 6F (0.29) and least by URP 4R (0.24). In ISSR-PCR, maximum heterozygosity was revealed by ISSR 13 (0.27) followed by ISSR 18 (0.25) and least by ISSR 6 (0.20). Maximum cophenetic correlation was found in ISSR (r = 0.789) followed by URP (r = 0.759). The combined analysis of both marker systems showed high cophenetic correlation (r = 0.810), which indicated a good fit of the data for diversity analysis. The study revealed that to the best of our knowledge this is a first report to use of URP-PCR combined with ISSR-PCR and is more sensitive and reliable in 206ptimize206 ion206206 genetic diversity in A. 206ptimize206.

Keywords: Alternaria 206ptimize206, genetic diversity, molecular markers and PCA analysis

P123: Recent Advances of Aloeverain Herbal Medicine and cosmetics Industries

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Aloe vera plant belonging to the Liliaceae family, has been used for centuries for its health, beauty, medicinal and healing properties. Many studies have proved that A. vera have several of its bioactive components that have anti-oxidant, anti-microbial, anti-inflammatory and evenimmunomodulatory effects.TraditionallyAloe used to treat many skins disease treatment against diabetes, diarrhea,thinning and falling hair.Aloe has aloe emodin, aloin and anthraquinone found to be relevant to cancer prevention.It is widely used in cosmetics,and pharmaceutical industries to treat many diseases.The present research an effort towards the lab to field applications.

Keywords: Immunomodulatory effect; Emodin; Anthraquinone; Herbal Medicine

P124: In-silico Mining of Simple Sequence Repeats (SSRs) in the Chloroplast Genome of DendrocalamussikkimensisGamble ex Oliv.

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Bamboos (subfamily Bambusoideae) are fast-growing perennials that are used by billions of people for food and fibre, and also contribute significantly to sustainable development. The present study was carried out to analyze the occurrence and distribution of SSRs in the chloroplast genome ofDendrocalamussikkimensis. The chloroplast genome sequence was retrieved from NCBI in FASTA format and SSRs were analyzed by using MISA perl script. The minimum motif repeat size was set to 10 for mononucleotide, 6 for dinucleotide, 5 for trinucleotide, and 3 each for tetranucleotide, pentanucleotide and hexanucleotide.A total of 42 SSRs were detected of which 7 were present in compound formation. Mononucleotide repeats were the most frequent (64.28 %), followed by tetranucleotides (33.33%) and pentanucleotides. No trinucleotide repeat was observed.

Keywords: Bamboo; SSRs; MISA; Mononucleotide repeats

P125: Studies on Chemical Characterization of Bioactive Compoundswithanolides and Withamine Through Mutagenesis in Different Varieties of Ashwagandha Collected from CSIR-CIMAP, Lucknow

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Ashwagandha (Withania somnifera) belongs to family Solanaceaealso called as Indian ginseng.Mother seed stock of Ashwagandha varieties (Procured from CIMAP, Lucknow) are used as material source for chemical mutagenesis through Ethyl Methane Sulfonate treatment, four different seeds of varieties Nimtili 118, Pratap, Cimpusti, and Poshita were treated with different dose of EMS 1%, 0.8%, 0.6%, 0.5%, 0.4% and 0.2%.In seeds of M1 generation plants, HPLC analysis reflects thatNimtili and Poshita varieties have more active ingredients of withanolides and withamine, and finally it ameliorates the quantity of bioactive compounds for pharmaceutical industries.

Keywords: Indian Ginseng; Withania; Mutagenesis; Withanolides; Withamine; Poshita;Cimpusti

P126: Polythene Degradation

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Plastic cause white pollution to the environment and this pollution becoming dangerous day by day. Plastic pollution is not spreading on landfill but it is spreading around the globe. Plastic pollution disturbed marine ecosystem and there are direct and indirect source of plastic pollution in ocean, seas and rivers. Main reason behind plastic pollution is domestic use of plastic and polythene bags causing serious pollution at large level. And this plastic stays in environment for thousands year. Therefore there are several type of degrade polythene but the biological degradation is the eco-friendly and cost effective method to overcome from this problem. Some microbes are present in the environment which has ability to degrade polythene. In the present research Aspergillus spp. Has ability to degrade polythene bags. Aspergillus spp. Found in the environment it is a soil fungus which easily grows in the environment and it has degradation ability. Aspergillus spp. Can degrade the polythene in 30 days and fungus secrete degrading enzymes through the secretion of these enzymes the degradation is effective.

Keywords: Biological degradation, Aspergillus, Degrading enzymes.

P127: Evaluation of Drinking Water Quality of Ashoknagar District Madhya Pradesh India

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Water is one of the essential resources for civilization, industrialization and urbanization; the necessity of regular water quality assessment. Therefore, the drinking water quality of Ashoknagar district (Madhya Pradesh, India) is assessed and summarized in this work by performing pre-monsoon and post-monsoon sampling. The entire district was divided into 6×6 Km^2 grids, and 124 samples in each of season were collected and analyzed for the parameters like pH, TDS, salinity, DO, EC, alkalinity, hardness, Ca^{2+}, Mg^{2+}, Cl^-, SO_4^{2-}, PO_4^3, F^-, NO_3^- etc. Though drinking water quality for a large number of samples was found safe (as per BIS standard), around 20% of samples were unsuitable.

Keywords: Drinking water quality, Ashokanagr District, Total Dissolved Solid, Total Hardness

P128: Organic Supplement in the Reduction of Chemical Fertilizer Usage in Chili Plant Cultivation

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The population is increasing in geometric progression; it is only possible to increase agricultural productivity through chemical fertilizer and pesticides. But the excess use of chemical fertilizer has adverse effects: soil salinity, heavy metal accumulation, soil pollution, water eutrophication and nitrate accumulation, water pollution, air pollution, greenhouse effects. Use of nutrients with balanced inorganic and organic sources can reduce the deterioration of soil health, as well as limit the contamination of groundwater. This investigation was undertaken in a span of 11 weeks, in which certain ratios of chemical fertilizer, biofertilizer and Organic Supplement [bio- adsorbent] have been used along with garden soil. Here 8 setups were made in multiple of 5. The differences in crop plants [Indian chili] with respect to its height, leaf numbers, size of the leaf, root length, nature of root, first appearance of bud, number of flowers, number of flowers that turned into fruits, size of fruits has been documented. Soil sample has been tested for some of its parameters. Viable and culturable microbes from each soil sample has been grown in the laboratory. The results indicate that use of proper combination of chemical fertilizer, biofertilizer and Organic Supplement [bio- adsorbent] gives higher yield.

Keywords: Crops, Fertilizers, Soil Health, Soil nutrition

P129: Water Quality Monitoring of Saura River Purnea Bihar

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River Saura flows east of main Purnea city separating the Gulabbagh and Khuskibagh from main town Purnea (26°05'26" N and 86°59'30" E). water samples were collected once in two months and different water quality parameters like temperature, PH, DO, TDS, EC, total alkalinity, total hardness Ca, Mg, nitrate ion, chloride, sulphate and some metals were determined to access the status of pollution level in river water. The variation in different water quality parameters for a two years period were tested for significant difference using student's t-test. The water quality parameters PH, DO, total alkalinity and chloride showed different at P= 0.05 for the year 2020 and 2022. The study states that the concentration level of different physiochemical parameters of the Saura river are within the permissible limits.

Keywords- Physiochemical parameters, water quality, Saura river.

P130: Gut Microbiome and their Probiotic Potential

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The microbiotais the normal inhabitant of our oral cavity, genital organs, respiratory tract, skin and gastrointestinal system. The total human microbiota is calculated and found to be equivalent to about ~10^{13} -10^{14} microbes having 1:1 ratio with human cells. The gut is the densest area in the human body approximately 10 times of all the cells in the human body and harbours about 3.8 ×10^{13} bacteria.Various factors influence the growth of the microbiome like gestational age, type of delivery whether normal or C- section, consumption of antibiotics, diet and hygiene.The diversity of the flora increases with the age and conditions as during the infant life the dominance phyla are Protobacteriaand Actinobacteria, in adult Firmicutesand Bacteriodes emerged.The composition of microbiota is almost similar for the whole life but alteration may be seen due to the change in the digestive physiology and diet.Colon contains approximately 10^{12} CFU/mL or more and the composition includes Bacteriodes, Porphyromonas, Bifidobacterium, Lactobacillus and Clostridium.The diet influence the composition of the growth of the organisms which depends on the food consumed, pH, host secretion, transit time through the GIT, host secretions, etc.The persons associated to vegetarian diets, gut microbiota is 211ptimize211ion211 by the domination of the species like Ruminococcus, Roseburiaand Eubateriumwhereas in persons havig non-vegetarian diets or western diet are associated with the decreasing numbers of Firmicutesand increase in Bacteroides.Antibiotics have both effects on the gut microbiome i.e. pathological as well as beneficial. As per estimate 70% of the immunity is considered to be influenced by digestion which is under the control of gut microbiome. The qualitative and quantitative distribution of various microbes in the gut is influenced by the diet and fibrous diet has been shown to facilitate the production of short chain fatty acids that trigger the immune response. Hence, it is desirable at this stage to study the effects of different vegetables and pulses to find out their effects on qualitative and quantitative colonization of gut by the microbes.

Keywords: Microbiome, Lactobaillus, Diet, Short chain fatty acids, Probiotic

P131: Statistical Approach and Graphical Interpretation to Understand the Devastation Caused by COVID19 Pandemic in West Bengal

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West Bengal is the fourth most populated state with a total populationof 97.69 million in 2022 and has always been among the states reporting highest number of positive cases during the successive waves of COVID19 pandemic which continued from June 2020 to January 2021 for first wave, March 2021 to July 2021 for second wave, December 2021 to February 2022 for third wave, June 2022 to August 2022 for fourth wave. A statistical approach has been performed 211ptimize211-test and descriptive statistics involving mean and standard deviation to analyse the effect of vaccination effort on deceased proportion along with graphical interpretation to understand the devastation caused by each wave and their comparativestudy has also been undertaken. The outcomes of the statistical analysis indicates that significant increase in vaccination effort from third wave to fourth wave has lead to a statistically significant difference between the deceased proportion of the two waves. Graphical interpretations form positivity rates and deceased proportions indicates biphasic peaks and prolonged time period of first wave and successive decrease in time period with rapid surge in cases reaching the peak and rapid fall in cases for other waves especially for third and fourth waves.

Keywords: Descriptive statistics, graphical interpretation, graph pad prism software, statistical analysis, T test.

P132: Promoting Ecotourism for the Pnly Floating Park of the World in Manipur for Sustainable Development

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Ecotourism means traveling to relatively undisturbed natural areas for studying, admiring, and enjoying the wild scenery as well as any existing cultural manifestations located in these areas. It is a form of tourism that takes place in natural areas, sustains local communities, and involve learning experience. KeibulLamjao National Park is an unique floating park of the world, located in Manipur, a hotspot of Biodiversity.It is the only abode for Brow Antlered Deer locally called as Sangai, the endemic and endangered animal. It is a State animal and 212ptimiz in Manipuri folk lores. Its a potential site for promotion of Ecotourism in Manipurmeeting the both ends of conservation and nature tourism. The paper points out how the ecotourism development for KeibulLamjao National Park Manipur will strengthen the link between conservation and sustainable development by involving local stakeholders.It s believed that promoting Ecotourism will become a catalyst by being a learning tool for all ages, and for locals as well as for visitors.

Keywords: Ecotourism, National Park, Manipur, Conservation, Sustainable Development

P133: Impact of Climate Change on Pathogenic Microbes : Boon or Bane?

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Climate change is undoubtedly a severe existential crisis to humanity in recent times. Microbes play a great role in regulating climate and being the most abundant species, they are also affected by climate change. Most of the time climate changing factors become beneficial for microbial growth and pathogenicity by providing them their optimum growth factors whereas sometimes these factors are responsible for restricting their growth and pathogenicity by different mechanisms. Several pathogenic microbes like Staphylococcus aureus, Streptococcus sp, Vibrio 212ptimiz have shown higher growth and infection rate due to temperature rise whereas infection capability of HSV and HPV virus has increased due to UV exposure. CO_2 emission results in positive growth of plant pathogen Erysiphe cichoracearum and rise in relative humidity levels helps in Pantoea agglomerans, Pantoea ananatis, Enterobacter cowaniiinfection. It is also seen that these factors are responsible for inhibiting growth and virulence in some microbes. Growth of Agrobacterium tumefaciens and Pseudomonas syringaeare inhibited by high temperature whereas UV exposure is toxic for Pseudomonas aeruginosa and COVID-19 infected cells. This study is focused on impacts of rapidly changing climate factors on several pathogenic microbes and their associated results on humans and environment.

Keywords: Superbug, SA-SSTI, Immunosuppressant, Squamous Cell Carcinoma (SCC), Colony Forming Unit (CFU)

P134: In-silico Approach in Determining Microbial Dominance in Heavy Metal Contaminated Industrial Effluent from Outskirts of Kolkata

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Heavy metals are non-biodegradable and occur naturally. Their extensive dissemination in the ecosystem as a result of their various uses has sparked worries about their possible implications on both public health and ecology. The primary sources of heavy metal pollution are either derived from nature or are man-made, and it is currently one of the top ecological issues around the world as various heavy metals may well become mobile in sediments depending on the pH level and their specifications and cause serious problems. For such remediation of heavy metal-contaminated soils, bioremediation is a possibly a low-cost alternative. In this study, the sample was collected from an electro-steel industry nearKhardaha, a place 20 km away Kolkata. The aim of this study was to investigate and identify certain bacterial flora which are anticipated to show result against certain heavy metals. The collected effluent samples were assayed for different physicochemical and microbiological parameters and were studied for their effect on the environment. Although, the area was found to be very much heavy-metal polluted, different microflora were isolated in abundance from the sample and were 213ptimize213ion213 by staining and other microbiological techniques. These isolates of pathogenic bacteria might be used in future research to overcome the stress of heavy metals in both water bodies and soil fields and thus we can find one good and effective solution for the pollution and contamination of heavy metals since these pathogenic bacteria were themselves isolated from a greatly heavy metal stress area.

P135: Role Of Scientific Knowledge in Sustainable Development

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Scientific knowledge is essential to improve the standard of living for the nation today. The standards of living of a nation whether in efficient agriculture, high quality food production, good health, comfortable housing, speedy communication or better roadways depends on science and technology. Improper literacy makes development unsustainable by affecting agriculture, industrial productivity, standard of living and life expectancy. Technology is the mother of civilization. Without a foundation in sciences, it is very difficult to achieve sustainable development. Usage of modern communication technologies including cyberspace, computer-aided education and distant education to reach more people leads to more development. There should be a national commitment regarding sustainable development. Out of seventeen global millennium sustainable development goals, the fifth goal is related with gender equity i.e., to empower all women and girls. The blueprint of the goals is designed to achieve a better and more sustainable future for all.

Keywords: Sustainable development, technology, civilization & literacy

P136: Studies on the Macrophytes of Kongba River, Manipur

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Floristic survey of a plant community provides valuable background information for analyzing the structural diversity and dynamics of the plant species. The structure and dynamics of the vegetation provide an indication of the whole environment both physical and biological. Kongba River of Manipur (Latitude 23.80^0 N to 25.68^0N and Longitude 93.03^0E to 94.78^0E) having a catchment area of about 120 km^2 starts at KongbaMeilombi and finally reaches Myanmar and joins Chindwin River. The river though small in size and length is considered as one of the most important river for the traditional community of Meiteis, the major inhabitants of Manipur. A total of 29 macrophytic plant species were recorded during investigation. Floristic composition of an ecosystem provides major anatomical characters of plant community. A total of 29 macrophytes species were found in the river from the different sites. Total macrophytic plants were categorized into 4 groups viz., 1) Free floating 2) Rooted floating 3) Submerged and 4) Emergent types. Out of the 29 macrophytic plants species, 20.68% were free floating, 3.44% 10.34% and 65.51% comprised rooted ,submerged and emergents respectively.The rich growth of emergent species indicates the enhancement of eutrophication in the river because of the various anthropogenic activities. So it is high time for us to check the enhanced eutrophication of the river by tackling remedial measures and giving awareness to the people living nearby.

Keywords: Kongba River, Floristic Survey, Macrophytes, Emergent, Eutrophication

P137: Status of Vulture Population at Jorbeer (Bikaner)

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Vultures are often overlooked as lowly scavengers. However, they are a key component to maintaining healthy ecosystems. Because of their role as nature's garbage disposers, vultures are able to keep the environment clean and free of contagious diseases. They are excellent indicators of biological status of environment in a particular area.

India is home to nine species of vultures, but most of them face the danger of extinction. Among these nine, seven species are observed in selected study area which are as follows Eurasian Griffon (Gyps fulvus), Himalayan Griffon (Gyps Himalayensis), Cinereous Vulture (Aegypius monachus), Egyptian Vulture (Neophronpercnopterus), Long Billed Vulture (Gypsindicus), White-rumpedVulture (Gyps bengalensis) and Red-headed Vulture (Sarcogypscalvus). Present study was carried out at Jorbeer (Bikaner) which is an animal carcass dumping area in the outskirts of Bikaner city of Rajasthan. The place is a favourite haunt of vultures, eagles, falcons and other carnivorous birds. The place is a government approved area for dumping of animal carcasses.

Direct observations were made from watch tower at feeding and roosting sites to assess the population size and vulture activities. Identifications were confirmed using proper literature and field guides. Observations were made with the help of 8x42 field binoculars and Canon SX60Camera. Total 3458 vultures were sighted during study period. Among these Egyptian Vulture was in maximum in number while Red-headed Vulture formed the minimum population.

The present study is an attempt to provide information about the population status of vulture species at Jorbeer(Bikaner) and to suggestconservation steps to protect vultures in the study area.

Keywords: carcass, contagious, extinction, indicators, roosting, scavengers

P138: Status of Drinking Water Contamination and its Impact (Industrial area of Adityapur, Jamshedpur) JHARKHAND

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Drinking water contamination is a serious problem throughout the world. It has vital concern for human health. Especially, Arsenic and Fluoride contamination in drinking water is a global problem affecting countries of all five continents. The most serious damage to human health has been reported from India, West Bengal, Bangladesh etc. Excessive and prolonged exposure of Arsenic(As), metalloid with drinking water causing Arsenicosis, pigmentation of skin, patches on face and palm of hand, cancer etc. Fluoride endemicity has been reported in several parts of Indian states including Bihar and Jharkhand. High concentrations of Fluoride in ground water have caused fluorisis, a serious bone disease. The present paper is aimed to study the status of drinking water quality with special reference to Arsenic and Fluoride contents existing in drinking water of study area taken in consideration during Nov.1917 to Aug.1918 (UGC sponsored project).

Keywords: Drinking water, Arsenic, Fluoride, Adityapur, Jamshedpur, JHARKHAND

P139: Women Empowerment and Environmental Management

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Women empowerment is a continuous process of empowering women in diversified areas. It includes awareness, capacity building, greater participation in decision making and control.

According to United Nations 2010, women are the key to sustainable development, peace and security. Women's work is related with managing natural resources, biodiversity and ecosystem while managing theirfamilies. As a result, their experiences and perspectives are essential to sustainable development, policy making and actions to protect environment.

Present paper describes a case study on women participation in arriving at the solution to the climate change problem in Gujarat State of India.

Keywords: Women Empowerment, Environmental Science, Sustainability, Climate change

P140: In Situ and Ex Situ Conservation of Land Biodiversity and Sustainability

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Humans have been directly or indirectly dependent on biodiversity for sustenance to a considerable extent. However, increasing population pressure and developmental activities have led to large scale depletion of the natural resources. Conservation is the protection, preservation, management, or restoration of wildlife and natural resources such as forests and water. Through the conservation of biodiversity and the survival of many species and habitats which are threatened due to human activities can be ensured. There is an urgent need, not only to manage and conserve the biotic wealth, but also restore the degraded ecosystems. Insitu conservation is on site conservation or the conservation of genetic resources in natural populations of plant or animal species, such as forest genetic resources in natural populations of tree species. It is the process of protecting an endangered plant or animal species in its natural habitat, either by protecting or cleaning up the habitat itself, or by defending the species from predators. It is applied to conservation of agricultural biodiversity in agro forestry by farmers, especially those using unconventional farming practices. In-situ conservation is being done by declaring area as protected area. Ex-situ conservation is the preservation of components of biological diversity outside their natural habitats. This involves conservation of genetic resources, as well as wild and cultivated or species, and draws on a diverse body of techniques and facilities. Such strategies include establishment of botanical gardens, zoos, conservation strands and gene, pollen seed, seedling, tissue culture and DNA banks.

Keywords: Biodiversity, Development, In-Situ Conservation, Ex-Situ Conservation.

P141: Study on Medicinal therapies against Candidiasis

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In pasttwenty years, the occurrence of fungal infections has significantlyenhancedincludinglethal systemic infections caused by Candidaspecies posing a major threat especially toimmune compromised individuals. Candida albicansis an opportunistic pathogenic fungi that cancause local and systemic infections in healthy individuals. However, these infections take a grave form in immune-compromised patients and that undergoing antibiotic treatment regime for prolonged time periods. One of the common clinical manifestations caused by Candida species is Oral candidiasis which is also the most frequent fungal infectionin the HIV-infected patients. Oral candidiasis may affect oesophagus hampering the intake of oral food, thus resulting in increasedmorbidity and mortality.

Since, the drug resistance in Candida spp.is escalating in response to current therapeutics along with serious side-effects of commercially available antifungalagents; there is a pressing need to discover new more efficacious antifungal agents with fewer side-effects. Herbal medicines like essential oils(Eos) derived from plants are still an important part of traditional medicine systems all over the world. Plant Eosis usually complex mixtures of polar and nonpolar natural compounds and are of rich medicinal value. They are principally composed of terpenoids and their oxygenated derivatives possessing several medicinal activities. In context with all these studieswe designed our present work in exploring anti-Candida activity of some plants from northeast regions of India.

Keywords: Candida aldicans, Anticandid activity, Essential oils, Terpenoids etc.

P142: Environment and Infectious Diseases: Emergence and Outbreaks

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Recent decades have witnessed a repeated wave of severe infectious diseases outbreaks, not least the COVID-19 pandemic which has had a devastating impact on lives & livelihood around the globe. Several scientific evidences support the role of the inanimate environment as a source of Healthcare-Associated Infections(HAI). Environmental factors like air, water, climate change, contact and zoonoses are responsible for transmission of such infections. Emergence of new infections or re-emergence of old infectious diseases results from natural processes, human practice and environmental contamination. Climate change is increasingly becoming a concern as a factor in the emergence of infectious diseases.

Keywords: HAI, environment, infectious diseases, transmission.

P143: Vegetation Analysis of Subtropical Forests from Nongmaijing Hill, Manipur with a Note on Distribution and Diversity

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There is a growing interest in quantifying habitat characteristics like forest structure, floristic composition and species richness in Indian forests. The present study focuses on variation in vegetative parameters and diversity measures in Trees,Shrubs and herbs from Nongmaiching Hill Forests ,Manipur.Two sites at Awaching(site-I) and NgariyalChing(site –II) ,at Nongmaiching hill which have altitude of approximately about above MSL were selected. Each site included two plots viz. natural forest and pine plantation (site-I) and two plots viz natural forest and degraded forest (site-II).Information on distribution and abundance of tree species and biodiversity is highly needed for the conservation and management of subtropical forest. The study is of much significance as Manipur included in Indo-Burma hotspot has a major contribution to the megabiodiversity of North-East India and people here rely on jhumming or shifting cultivation depending upon forest productivity to maintain livestock and soil fertility. Sustainable management of valuable forest resources can only be ensured by the safeguard and maintenance of the valuable biodiversity present in this biodiversity hotspot.

Keywords: Nongmaijing Hill, vegetative parameters, conservation and management

P144: Fisheries Co-operative Society Dauladhar-Fish Catch during Four Years From Gobind Sagar Reservoir (Himachal Pradesh) India

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Fisheries co-operative society Dauladhar is one of the co-operative societies working in GobindSagar Reservoir (Himachal Pradesh). This reservoir was created by damming River Sutlej at village Bhakra in 1963. Eight landing centers have been established around this reservoir. Data of caught fish during year 2013 to 2016 was obtained from state fisheries department of Himachal Pradesh Govt. Data was compiled and tabulated. During June and July months no fish was caught. This season was declared by the state fisheries department as close season. Gill nets having mesh size more than 5 cm were used by the licensed fishermen, to catch the fish. Catlacatla, Labeorohita, Cirhinamrigala, Sperataseenghala, Hypophthalmichthysmolitrix, Cyprinuscarpio, Tor putitoraand Labeoderowere some of the caught fish species. Seed stocking was done from time to time, by the state fisheries department of Himachal Pradesh Govt.Hypophthalmichthysmolitrixhave got accidently introduced in this reservoir in year 1971. Catch was dominated by

Hypophthalmichthysmolitrix and Cyprinuscarpio. Fish caught was 375 (174.5 kg) during May and 2690 (7008.5 kg) during August month in year 2013.Total individuals of Cirrhinusmrigala caught were 63in year 2013. Individuals of Labeodero / L. batacaught during March 2014, were 2679 (weighing 820.5 kg). During August in year 2014, total 2573 individuals of fish were caught by this co-operative. Total individuals caught during August 2015 and August 2016 were 3764 and 3055 respectively. Ctenopharyngodonidella caught during year 2016, were 5 individuals weighing 48.5 kg. Individuals of Labeocalbasu caught were only 3 (weighing 2 kg) in year 2013.

Keywords: reservoir, gill nets, fishermen, fish conservation.

P145: Escherichia Coli –Polymer Bead For Setting Out Bioremediation Process

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Microbial cell immobilization in a polymeric bead is a technique in which microorganisms are trapped within the complex matrix of water- insoluble gel. The microbial cells are entrapped into the matrix. They are not directly attached to the support surface, rather simply encapsulated inside the polymer matrix. Polymer beads are completely biodegradable and have no environmental pollution effect. Moreover it does not change any genetics characters of species, increases stability, protection against contamination. Our experiment, immobilization of Gram (-) bacterium E. coli was carried out by using sodium alginate gel beads entrapment technique where 220pti. colicells are entrapped within a solution of sodium alginate and PVA (Poly vinyl alcohol) mixer. E. coli beads are produced with in calcium chloride solution. It looks like a circular, white, soft gel. E. coli cell are present in viable form for a long time period in that polymer bead. It will be used as a stock culture in laboratory. On treatment it significantly reduced the microbial contamination from effluent and increased dissolved oxygen concentration, therefore may be applicable in waste water treatment and detergent industry to remove dirty.

Key words: Cell immobilization, PVA-Sodium alginate bead, Escherichia coli, BOD level, Dissolved oxygen

P146: Concern on Emerging Containments: A Systematic Review

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This review article focused on the emerging containments like chemicals, bio containments, effluent from industries and environmental issue like pollution, that are affecting aquatic as well as terrestrial life. The major emerging groups of containments are pharmaceutical products, drugs, cosmetics products, hormonal and steroids like products that are used in day to day life. Synthesizing and using such products that are hazardous raised a direct question on mankind as well as affecting economy. Identification and analysis of inorganic and organic chemicals enhance the uses of analytical technique as well as increase the wide scope for new discoveries.

Keywords: Containment, Emerging, Pharmaceutical, Analytical drugs

P147: Spatial Attributes of Timberline in The Indian Western Himalaya Region: A Study of Jammu & Kashmir

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The Himalayan timberline is very sensitive to climate change and could provide biological proof of global warming and mountains of Himalaya rise abruptly, resulting diversity of ecosystemsandlandscapes. The present study analyses timberline and topographical influences of mountainous terrain along altitudinal gradient in Indian western Himalayan region. Timberline mapping covering the entire state of Jammu & Kashmirand based on their locations, two types of timberlines, Continuous timberline (CTL) and island timberline (ITL) have been described. The total length of timberline in Jammu & Kashmir was notes as about 3,297 km, of which CTL type accounted for about 71%, and ITL type, the rest. The 34003800m elevation range accounted for 40 % of total timberline length of CTL type. The peak distribution of ITL type timberline was at a bit lower elevation band than continuous timberline type. Of the total length of ITL type, about 64.8% occurred between 3000-3600m. It can be deducted that complexities of topographic features in the mountains positively influence the distribution of timberline which may react sensitively to climate warming and anthropogenic changes in different behaviours.

Keywords: Climate Change, Mapping, Timberline, Topography, Western Himalaya

P148: Hydrocarbon Degradation by Micro-fungi from contaminated soil

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Petroleum is one of the most important energy resources to boost economic development. Toxicity due to petroleum causes an adverse effect on the environment and due to its carcinogenic nature shows negative impact on humans and animals. Therefore its removal from the soil becomes a matter of concern. A lot of techniques are in use for the proper remediation of petroleum from the contaminated soil. Micro-fungi provides a sustainable solution for remediation from the environment due to their ability to survive in harsh environmental conditions. Myco-remediation is the most important techniques which employed the removal of toxic compounds by using fungal biomass, due to the production of various extracellular enzymes. This chapter high lights the concept of myco-remediation and the enzymes involved in the process of degradation, their mechanism, and the factor affecting the degradation process. This chapter also provide future understanding and techniques towards the problem of petroleum-contaminated soil.

Keywords: Petroleum, soil contaminated, extracellular enzymes, toxic compounds

P149: Use of Self Watering Pot with Different Fibres for Growing Medicinal Plants

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Medicinal plants are very much essential for human beings and all other living organisms to enjoy a diseases free healthy life. Self-watering pot is a simple device where we can grow small type of medicinal plants. It is a very simple method and better way to grow medicinal plants. Due to the availability of important nutrients and vitamins, medicinal plants in terms of vegetables and herbs may be grown by using this process. In the present study some waste plastic bottles are used for growing plants. In the present system drip irrigation is done through the capillary tube of the fibres. In the self watering pot after emerging one end of this tube in the water containing half of the bottle in such a way that the fibrous rope absorb water. But what type of plant will be grown with what type of fibre, that will be decided on the capillary action of the fibre. Thinner fibres have higher capillarity, so this method can be used for the plants which need more water and vice versa. Experimentally, we can find out the capillarity of different plant fibres and their dependence on temperature and some of the experimental work have been reported in this paper. Exact data of the experiments will be reported later on.

Keywords: Self-watering pot, Capillarity, Medicinal plants, Nutrients, Fibre rope

P150: Relationship of Potential Kidney Stone with Drinking Water in Sangrampur Tehsil of Buldana District, Maharashtra.

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The high incidence of renal disorders/diseases in Sangrampur Tehsil of Buldana District in India has been a matter of great concern. The present work deals with the physicochemical analysis of drinking water and number of kidney stone patients found in the study area. The 223ptimi-chemical parameters such as pH, Electrical conductivity, TDS, Total hardness, Ca hardness, Mg hardness, Chloride, Total alkalinity and Acidity were analyzed (APHA, 1998) to know the present status of the drinking water quality during the periods of one year from February 2013 to January 2014 and correlated with kidney stone patients. It was observed that, water parameters were found above the permissible limit and responsible for increase the kidney stone problem in the study area.

Keywords: Sangrampur Tehsil, Drinking Water, Total Hardness, Kidney Stone.

P151: Effect of 6-Gingerol against Exhaustion

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Ginger is a medicinal plant and it is used as Anti-viral, Anti-fungal, Anti-parasitic, Antioxidant agent. Ginger contains several types of ligands showed good interaction with selected target based on In-silico analysis. During this research6-Gingerolwas found superior due to its solubility and neurotoxic effects in comparison to other ligands. It was isolated and extracted from fresh Zingiber officinale to determine its effects against exhaustion. The loading forced swimming time, glycogen content in liver and muscle, lactic acid content in blood and the captivate of urea nitrogen in serum were determined through the mice treated with 0.25 mg/kg of 6-Gingerol for 45 days. The results indicate that the mice swimming time treated with 6-gingerol was longer that that treated with distill water & the content of glycogen in liver and muscle or the recovery rate of lactic acid increased. 6Gingeroldecreased the amount of urea and nitrogen in serum after swimming. This research concludes that 6- Gingerol exhibits fatigue resistance. The exhaustion mechanism of 6- gingerol is the results from increasing the level of Glycogen storage in liver and muscle, which effect the aerobic metabolic ability in strenuous muscles activities, accelerate the elimination of exhaustion and enhance the adaptation to load exercise.

P152: The Microbial Load of Street Food: How Harmful it is?

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It is crucial to assure the microbiological standard before consumption due to the rising popularity of Chinese street cuisine among consumers of all ages. Chowmein is one of the most well-known street foods. It includes meat in addition to a few other components and is particularly prone to microbial colonization, especially given the present climatic change. The people of West Bengal are fortunate to have a certain gut microbiota that shields them from its negative effects even though they consume this street cuisine on a daily basis. The likelihood of microbiological contamination in the chowmein may be brought on by improper packaging in an atmosphere that isn't at all aseptic or it may be brought on by prolonged storage and preservation of the food before cooking. There are several microorganisms present including Bacilluscereus, Staphylococcus aureus, Bacillus subtilis, etc. As a result, the first step in identifying the native flora in chowmein is to use the raw chowmein as a master stock for a differential analysis to check for microbial contamination based on the natural characteristics of chowmein. Many people around the world choose meat as their primary source of animal protein because of its high nutritional content. Meat rotting during distribution can be seen as an ecological phenomenon that includes changes in the substrates available (such as low molecular weight components), during the prevailing of a particular microbial association the so-called specific spoilage organisms, are in dominance (SSO). In fact, ephemeral spoilage organisms, a far smaller subset of SSO, are responsible for meat rotting (ESO). First, three different varieties of meat were selected for comparison; two of them were branded meats and one was local meat. By using raw Chowmein from a street vendor as a master stock and differential analysis to check for microbial contamination based on its intrinsic characteristic, it was possible to determine the indigenous flora and its intrinsic sustenance in Chowmein.

Keywords: Microbiota, Streetfood, Rawmeat, Contamination, Gutmicroflora

P153: Futuristic Environment-friendly Bio-Ink From Novel Bacterial Strains

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Three-dimensional bioprinting conventionally uses a combination of cells and mostly biopolymer-based hydrogels as bio-inks to create tissue-like structures. Recent research has brought to light the scope of microbial ink through genetically modified extracellular matrix (ECM) without any additional polymer rendering it an environmentally-sound approach. By the omission of the use of polymers, the chances of non-biodegradability are minimal. Modified extracellular matrix from bacteria bearing optimal properties in terms of viscoelastic performance develops the microbial ink, which exhibits high cell viability, printability, structural integrity, and shape fidelity. The study looks into the prospect of the use of different biofilm-forming colonies as isolated from tooth-etching as a future source of bio-ink.

Keywords: biofilm, modified extracellular matrix, amyloid proteins, tooth-etching, bio-ink, 3D bioprinting, eco-friendly

P154: White Flower Variety of Rhododendron 225ptimize225 (Sm.) – First Record from the North Western Himalayan Region, India.

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Rhododendron 225ptimize225 (Sm.) is one of the important members of the family Ericaceae (Juss.) that has been explored widely across the globe. Particularly, in the Indian Himalayan Ecosystem, this species holds a very special and sacred place. The local inhabitants of Indian Himalayan Region (IHR) are dependent upon Rhododendron 225ptimize225 (Sm.) for various purposes which includes domestic (fuel wood, fodder, sacred offerings, ethnomedicinal uses, etc.) and commercial (juice, jam and other edible products) uses. Apart from this, ecologically also Rhododendron 225ptimize225 (Sm.) is very significant as it shows a wide range of interesting morphological variations along an altitudinal gradient in the IHR. All of these factors have made Rhododendron 225ptimize225 (Sm.) the most expansively studied species of the IHR. Yet, there are many research gaps and loop holes especially when it is about taxonomic description of different subspecies and varieties of Rhododendron 226ptimize226 (Sm.), specifically in the state of Uttarakhand. The present study highlights one such character, the white flower variety of Rhododendron 226ptimize226 (Sm.) recorded from Uttarakhand, which has not been discovered from entire North Western Himalayan region (no published record). The main objective of the present work was to report this variety so that important conservation measures can be taken before its exploitation or any other anthropogenic damage that can occur accidently or deliberately for the species.

Keywords: Rhododendron 226ptimize226, white flower, North Western Himalaya region

P155: Characterizing Patterns of Treeline Ecotone in Indian Himalaya with Special Emphasis to Kumaun, Uttarakhand

Vandana Bisht, Subrat Sharma & S. S. Bargali

In the alpine ecosystems the transition zones are most sensitive spots and changes can be observed there in minimum turnaround time. This study was carried out to understand the alpine ecotone structure through in-situ observations in alpine treeline ecotone. For this study, two treeline ecotone sites viz., Nan Pakhwa and Pakhwa located at Bageshwar district of Kumaun Himalaya were selected. Total 96 species, 70 herbs, 18 shrubs and 8 tree species were reported from overall study sites. Similarity indices studies reveals that within treeline ecotone, species composition in case of herbs, shrubs and in case of trees also, highly differs on going from below treeline to alpine meadow. Within studied treeline ecotones, quite rich flora even with comprising a smaller land area of Himalayas, harbours a good proportion of plant diversity

Keywords: Alpine, Treeline, Phytosociology, Flora, Diversity, Timberline.

P156: An Assessment of Economic Loss by Health Effects Due to Menace of Ambient Air Pollution In India: With Special Reference to Agra

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The study highlights the annual and seasonal concentrations of $PM_{2.5,}$ estimation of health risk assessment and evaluation of economic loss due to air pollution in Agra city, which is the fourth most populated city in Uttar Pradesh and twenty third most populous cities in India. The results, mean concentrations of $PM_{2.5}$ are highest in winter (141.91 µg/m^3) followed by post monsoon (131.66 µg/m^3), summer (67.85 µg/m^3), and monsoon (37.13 µg/m^3). Exceedance Factor found more than 1.2 during the study period and more than 1.5 in 2016, 2017 and 2018 for $PM_{2.5,}$ which indicates the critical health risk of air pollution. The population weighted mean of for $PM_{2.5}$ is 1.35µg/m^3 in 2020. Health risk assessment has been performed using AirQ+v.2.1.1 model developed by World Health Organization. Mortality, all (natural) causes (adults age 30+ years); estimated number of attributable cases is 1019.5 (736.99-1233.67). Mortality/incidence due to lung cancer (adults age 30+ years); estimated attributable proportion is 57.9% (33.5% -71.9%). Mortality due to ALRI (Acute lower respiratory infections) in children age 0-5 years; estimated number of attributable cases are 900.2 (565.6-1151.9). The monetary cost burden due to air pollution related health risk performed by value of statistical life (VSL) is Rs. 0.791 million.

Keywords: Air pollution; health risk assessment; AirQ; economic loss.

P157: A study on Heavy Metal Content in Riverbed Sediments of Ganga River over Vaishali in Bihar, India

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Increasing industrial growth and use of fertilizers and pesticides to meet the demand of food has contaminated the water environment of river. Riverbed sediments act as sink for pollutants released from anthropogenic activities and gives surrogate information of water quality of river. Indo-Gangetic basin is hugely populated and Ganga River is like life of people living in the region over near Ganga River. Hence, the aim of the present research was to determine the water environment quality of Ganga River near Vaishali district of Bihar and identify sources of pollution. The sediments were collected from the different sites in 2018 in the period from July to October. The sediment samples were collected from different sites, transported to the laboratory and analyzed for metals viz., Zn, Cr, Pb, Cd and Cu. Analysis were carried out using flame absorption spectrometry method. The highest content of Zn, Pb and Cr were recorded in the sediments, which may be resulting from the city pollutant and dead body burning near the city. The research suggests anthropogenic activity and impact of agricultural activity for slightly elevated Cd level. Water quality index were also determined. There is urgent need to take steps for control measures and to stop contamination of sediments of river near to highly populated and polluted areas.

Keywords: Heavy metal, riverbed, and sediments

P158: Urbanisation – Induced Land Change Impact in Selected Districts Of Gujarat

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Rapid population growth and anthropogenic activities lead to substantial changes in natural landscapes and other environmental phenomena. Agglomeration of the population in a defined area leads to 228ptimize228ion which again has multiple consequences such as pollution, sanitation, overuse of resources/energy, degradation of biodiversity etc. One of the prime impacts of 228ptimize228ion lies in the land use and land cover (LULC) type. The land gets transferred and interchanged with fellow LULC types which lead to the degradation of water bodies, agriculture and forest area etc. Gujarat is a hub known for its medium to large-scale multiple chemical, clothing and other industries. Gujarat has mangroves on its coasts, various river bodies, dense forest diversity etc. which makes it more sensitive towards 228ptimize228ion and other sporadic developmental work. The establishment of these industries results in the destruction of its diversified environment. Gujarat LULC has classified as barren land, forest, rivers/canals, agriculture and built-up etc. to make us understand how it is changing with 228ptimize228ion. From the analysis of these LULC classifications, a subtle understanding of Spatio-temporal change would be made. The outcome of this paper will help to understand the 228ptimize228ion trend and its correlation with the change in the LULC of the region. Based on the overall understanding policy reforms or recommendations to government officials would be made for urban sustainability and also to overcome the possible consequences of rapid 228ptimize228ion.

Keywords: Urbanisation, Sustainability, LULC

P159: Urban Avian Diversity of Udaipur (Rajasthan) and Their Conservation Problems

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Urban environment as new ecosystem is of great interest all over the world. These man-made ecosystems have certain areas with high biological diversity, including both remnant species and species unintentionally or firmly introduced by human actions.

Study was conducted in Udaipur city to estimate bird diversity and their conservation problem, from 2019 to 2021. During the study period 46 species of terrestrial (Table 1) and 41 species of aquatic birds (Table 2) were identify which were belonging to 24 and 13 families. In terrestrial birds 44 species were residential ® and 2 species were winter migratory (WM) and according to IUCN 2022 categorization 45 species were least concern (LC) and only 1 species (Egyptian vulture) was found in endangered (EN) category. In aquatic birds 16 species were winter migratory (WM) and 25 species were resident ® and according to IUCN 2010, 4 species (Painted stork, Wooly-necked stork Black-headed ibis and Black-tailed godwit) were near threatened (NT) category and 38 species were least concern (LC) category. Study showed that number of bird species was low from their surrounding areas and faced many conservation problems. These are: Change vegetation structure, change vegetation composition, distance to natural vegetation, interactions with other birds, non-native predators, lacking of nesting sites, destruction of ecosystem process, noise, habitat alteration, food supply changes, pollution and increasing human population.

Keywords: Aquatic, endangered, near threatened, residential, terrestrial, winter migratory, urban, Udaipur city.

P160: Hazardous water pollution effect on Human health

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Water that is most underlying or say primitive exigency of life not really for humans only even so essential for all living. No one from us even imagine to live without water. Human itself producer of major water pollution. Water Pollution occurs by unwanted materials discharge in the water of rivers, lakes, ponds etc. Due to the rapid Urbanization and Industrialization water pollution increase day to day. The chemical waste of chemical industries, fossil fuel plants, industrial effluent the chief and major water pollution source not only that but organic and agriculture waste also responsible. As a result of pollution many aquatic animals like fishes, birds suffers and died due to the pollution that directly or indirectly food web of ecological system. As a result thousands of people generally children die everyday across the world from cholera, diarrhea, hepatitis A, polio and many more other water born disease due to the improper sanitation and management of water. It's the urgent call for us and governmental authorities to pay pay their attention this side. We have to aware people about hazardous effects of water pollution on their health.1986 with main objective to improve the quality by inspection diversion and waste treatment of the Ganga's water the Ganga Action Plan (GAP) was launched.

Keywords: Hazardous, BOD, GAP, Food web, Sanitation

P161: Soil Pollution

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Soil pollution is a chemical degradation process that consumes fertile soils, with implications for global food security and human health. All the soils contain compounds that are harmful to human beings and other living organisms. Soil contamination can occur because of human activities or because of natural processes. The discharge of industrial waste into soil can result in soil pollution. The use of insecticides and pesticides for a long period can cause soil pollution. Acid rain is caused when pollutants present in the air mix with the rain and fall back on the ground. Oil leaks can happen during the storage or transport of chemicals. Soil pollution is a complex issue that must be addressed. The contamination of soil has a major consequence on human health. The presence of heavy metals in very high concentration present in soil can cause them to become highly toxic for human being soil pollution is when the soil is contained by different pollutants like toxic chemicals from man made products or even from wind or precipitation, which are natural pollutants.

Keywords: degradation, contamination, insecticides, pesticides, precipitation.

P162: Impact of Different Temperatures on the Aroma of Rice

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A recessive gene boosts the accumulation of various volatile chemicals to produce fragrance, which is a crucial grain quality attribute of aromatic rice. The production method, genetic make-up, environmental factors, and their interactions all affect how aromatic the rice grain is. The most important environmental factor that might impact the scent quality and chemical make-up of fragrant rice is temperature. According to the findings, higher temperatures do not favour rapid grain filling, early maturity, or grain weights of 1,000 grains or more. They also considerably lowered the kernel length, amylose concentration, and grain output per plant. While taking into consideration aromatic rice, the most important gene that affect the fragnance are badh2, p5cs and 2AP (2 Acetyl -1-pyrroline). In this study, the relative expression of the badh2 and p5cs genes, the concentration of 2AP (2-acetyl-1-pyrroline), the content of proline and amylose, as well as the morpho-agronomic performance of photoinsensitive basmati rice were evaluated in relation to different temperatures (early, normal, and late sown conditions).

Keywords: Rice, badh3, p5cs, 2AP, temperature.

P163: Over Population : One Cause Multiple Effects

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More humans have been added to the world's population in 40 years. Every day the global population grows by 2.1%. As of November 2022, world population has crossed 8 billion mark. Overpopulation has recognized as global problem since decades, as it causes a number of adverse effects on environment. Overpopulation has resulted in a series of catastrophic consequences by causing increased pressure on nature, deforestation, climate change, decline in biodiversity, food shortage, increase in energy demand are most severe impacts of overpopulation. As the population increases rate of daily good items increases that effects the livelihood of people to greater extent. Due to lack of space developmental projects are being shifted to forest areas, thus snatching natural habitat of tribal people. High competition among youth for employment, shelter and food. These are some of the issues that do not get serious attention of people. Such global degradation has been addressed by various environmentalist, control advocates, media houses. One such group has also sponsored a statement, signed by leaders of 46 countries clamming that "Degradation of nature, income inequality exists today and the potential for conflict exist today due to overpopulation and overconsumption". Thus, concrete steps to be taken on national and international level to stop the adverse effect of overpopulation so that sustainability of natural resources can be ensured for future generation and they can also enjoy natural resources.

Keywords : Overpopulation , climate .

P164: Ozone Depletion

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Ozone is an important constituent of the atmosphere. The ozone layer, which is formed by ozone, is a separate layer in the lower stratosphere. Because it shields people and other living things from damaging short-wavelength ultraviolet (UV) light, the ozone layer serves as a thin shield. It has been a source of worry for more than 20 years that certain agents, particularly chemical ones, can impact the amount of ozone in the atmosphere. The combination of routine measurements of ozone depletion, careful laboratory studies demonstrated that the reactive fragments of chloroflurocarbons breakdown in the stratosphere are responsible for ozone depletion. As CFC's have widespread and sometimes apparent essential uses in modern society, there has been an intense effort to develop safe, effective replacement which have a negligible or much smaller impact on the environment. To regulate and gradually phase out the chemical substances responsible for ozone loss, the Montreal Protocol was implemented and ratified by more than 140 countries.

Keywords : Ozone , CFCs , Atmosphere, UV.

P165: Biodiversity Loss: A Developmental Issue

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The most unique feature of earth is the existence of life and the most extra ordinary feature of life is its diversity these was overwhelming agreement global biodiversity loss will likely decrease ecosystem functioning and nature's contribution of people biodiversity is not just a wildlife. It is the diversity of life from genes and microorganism to top predators and whole ecosystem two decades ago at the first earth summit majority of the world nation declared that human action such as overexploitation hunting &wishing habitat loss pollution and climate change associated with global warming are degrading the earth ecosystem eliminating genes, species and biological traits at an alarming rate. Declining biodiversity lowers an quality of the ecosystem services. Biodiversity loss has many consequence, not only for the environment but also for human beings at the economic and health level hence, we have stop this degradation by following few measures such as recycling the product that we buy, protecting local habitat and protecting wildlife, leave critical wildlife habitat undisturbed, reduce the spread of weeds. Hence reducing waste of consumer goods. Thus, these steps to be taken to minimize the adverse effect of overpopulation on so that future generation can enjoy the natural resources.

Keywords: Biodiversity, development, pollution.

P166: Environmental Economics

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Environmental economics has developed from its humble beginnings in the 1960s to become a significant area of study within economics. It integrates established research in the field of welfare economics and the theory of economic growth with more contemporary viewpoints on the political economy of picking out policy tools and the philosophy of sustainable development. The main tenets are that environmental problems come from economic systems' inability to 233ptimize human well-being, that environmental quality is important for both traditional economic growth goals and human well-being, and that effective policy may be implemented through incentive design. The pursuit of sustainable development and the environmental damage brought about by economic activity gave rise to the study of environmental economics, which is still developing. It is focused on the formulation and application of environmental policies.The foundation of environmental economics was the neoclassical approach to a variety of problems, including the ineffective administration of public goods, market failure, unfavourable externalities, and inefficient resource allocation.

Keywords : Economics , sustainability .

P167: Loss of Biodiversity

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Earth's ability to support life is its most distinctive characteristic, and that life is so diverse is truly astounding. The Earth is home to about 9 million different kinds of fungus, protists, animals, and plants. Likewise, 7 billion people do. Many countries around the world announced two decades ago that human activity was destroying the Earth's ecosystems and eradicating genes, species, and biological features at an alarming rate. This finding raised the question of how ecosystem function and the capacity to deliver the products and services required for civilization to succeed will be affected by such a loss of biological diversity.

The capacity of ecosystems to function effectively and efficiently, and consequently the capacity of nature to provide a healthy environment, is undermined by biodiversity loss. This is crucial in light of the fact that biodiversity loss weakens nature's adaptability to change and may have serious direct effects on human health if ecosystem services are no longer sufficient to meet societal demands. Changes in ecosystem services have an indirect impact on local migration, livelihoods, income, and, on rare occasions, even political strife.

Biodiversity loss is caused by five primary drivers: habitat loss, invasive species, overexploitation (extreme hunting and fishing pressure), pollution, climate change associated with global warming. Each event directly involves people and their behaviours. We need to pay the most attention to plant and animal species that are in danger of going extinct. We must make sure that both major policy reforms and individual collective transformation are implemented.

Keywords: Biodiversity , Habitat , environment.

P168: Arbuscular Mycorrhiza Fungi and Suatainable Farming

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The most frequent symbiotic relationship between plants and microbes is known as arbuscular mycorrhiza. AM fungi are found in most natural habitats and offer a variety of significant ecological services, including enhancing plant nutrition, stress resistance and tolerance, soil structure, and fertility. AM fungi also interact with the majority of crop plants, such as fruit trees, vegetables, and grains, therefore they are receiving more attention for their potential application in sustainable agriculture. Under upland conditions, plants easily form mycorrhizal connections, but because of the anoxic environment in submerged conditions, infection is uncommon. Numerous plants have shown that mycorrhiza increases photosynthetic capacity and nitrogen uptake in stressful environments. Utilizing environmentally sound sustainable agricultural practises that are essential to agro-ecosystems. This farming must be economically viable, environmentally sound, and socially responsible. The majority of agricultural and horticultural crops have symbiotic relationships with AM fungus, which make nutrients available to crops. They also increase soil fertility. Generally speaking, AM fungi play an important role in plant growth and health, earning them a reputation as ecosystem engineers and biofertilizers. AM inocula have been created and used in horticulture, agriculture, landscape restoration, and site remediation over the past 20 years.

Keywords: AMF, sustainable farming, agro-ecosystem.

P169: Bioremediation of Petroleum Spill in Marine Life

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The demand for petroleum and petroleum products is increasing day by day, while oil spills and improper discharge of industrial waste contributes to the rising contamination of the environment with petroleum hydrocarbons. The petroleum hydrocarbons spill ensures changes to micro-fungi consortia in oceans which might cause ecotoxicological impacts of marine life. It is of utmost important to avoid flaring and resort to cleaner techniques such as bioremediation. This study focuses on bioremediation of marine petroleum spill by micro-fungi consortia using bio-stimulant which supplements the limiting nutrients to the affected sites to aid the existing petroleum degrading microfungi. Although bioremediation is a technology, there is continuous research underway which is investigating the practically and efficiency of this process. There have been downsides found for using bioremediation for marine petroleum spills, however there are many benefits which this feasible technology.

Keywords: Petroleum, Bioremediation, biostimulation, Hydrocrabons

P170: Abstraction of Forest

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Forest plays a vital role in every living beings life. Once forest is vanished total ecosystem will disappear and other organism will suffer and finally they will demise. A bio-diverse habitat of resources and animals is represented by ecosystemsIn the production of food and nourishment, forests and trees are crucial. In additio n to contributing significantly to dietary diversity, quality, and quantity, plants and animals fo und in forests offer nutrient-rich food sources. Forest foods improve the taste. Each and every action of human is noticed by the forest and according to that it reacts. The nutritional value of forest foods has been exploited and promoted, throughout the evaluation of wild foods, to be addressed to a responsible human consumption and sustainable use of natural resource. Forest is the main source of everything.

P171: Abstraction of Climate

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Climate change science points to an increase in sea surface temperature, increases in the severity of extreme weather events, lowers the air quality, and unstability of natural systems due to increases in greenhouse gas emissions. The direct and indirect health results of such a global imbalance include excessive heat-related illnesses, waterborne diseases, increased exposure to environmental toxins, and respiratory diseases due to declining air quality, and mental health stress among others. Vulnerability to these health effects will increase as elderly and urban populations increase and are less able to adapt to climate change level. The co-benefits of improving health while addressing climate change will improve public health infrastructure today, while mitigating the negative consequences of a changing climate for future generations People are adversely effecting from the certain problems of nature and we are the major reason for that is occurring.

P172: Dhoopbatti From Temple Waste : A solution to Vayupradushan

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The paper aims to draw the attention of people towards the elevated risks of airborne transmission of diseases and the associated risks to students in classrooms of colleges, post pandemic. Students are observed sitting in close proximity coughing, sneezing and breathing which elevates their exposure to bioaerosols. To cleanse the classroom environment, a very simple, economical and sustainable approach was experimented by burning organic dhoopbatti made from temple waste (unused havansamagri and flower waste). The passive sampling study revealed an appreciable decrease in the total microbial count (28CFU/room) compared to initial TMC (388 CFU/room).

Keywords: Dhoopbatti, sustainable, total microbial count, temple waste.

P173: Regulation of Methane Oxidation Rates in A Tropical River network

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Rivers and streams are important source of atmospheric methane (CH4). Aerobic oxidation (MOX) is an important process that can reduce CH4 emission. Yet, the extent and drivers of MOX in rivers is not well understood, especially in the tropics. Here, based on extensive incubation experiments in Krishna River, we estimated large variability in MOX rate (0.03 and 2.02 µmol L - 1 d -1 ; 0.38 ± 0.49 µmol L -1 d -1). We show that in addition to temperature, concentrations of CH4, oxygen, and total phosphorus were emerged as important factors shaping the MOX rates. Our study reveals hitherto unrecognized variability and have the potential of mitigating CH4 emission from the tropical fluvial networks.

Keywords: Methane, tropical rivers, oxidation

P174: Isolation of the Microorganisms in Municipal Solid Waste Leachate and Soil Samples From Tenali Municipal Dumpsite

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Solid waste is one of the major pollution in present days due to over population, urbanization, and improper management leads to various environmental and health problems in the world, municipal solid waste has more organic solid waste materials, which are favour to existence of microorganisms, these microorganisms were isolated from the municipal solid waste dumpsite leachate and soil samples in Tenali municipal solid waste dumpsite, with Gram staining, Antibiotic sensitivity assay, Serial dilution and Spread plate method, the results revels that the bacteria type and their frequency of isolation during the study are Bacillus spp (45.06%), pseudomonas spp (40.15%), klebislla spp (15.45%), Cercospera spp (4.35%), Alternaria spp, E coli and Coli form (5.15%). Among the bacteria isolated Bacillus spp (45.06%), and pseudomonas spp (40.15%), had the highest frequency of isolation in Stations A, B, D and E respectively, and identified the fungal species and microbiological characterization was carried out Round shaped Aspergillus, Fusarium spp, Alternaria spp was observed. The Tenali municipal dumpsite is a landfill and not scientifically designed. Hence, to prevent future contamination of heavy metals and organic and inorganic materials, Potential pathogens and toxin producing microorganism were identified. These observations are of prime health concern because there is no known containment or treatment system for the leachate generated from the study site. Our findings would be of assistance in the assessment of hazardous effects of chemicals from waste landfills discharged into the aquatic environment and in making policy on environmental waste management.

Keywords: Municipal Solid waste, Organic material, Gram staining, Antibiotic sensitivity assay, microorganisms, Contamination

P175: Environmental Prevalence, Transformations and Regulation of Engineered Nanomaterials

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Engineered nanomaterials (ENMs) are materials where particles arein an unbound state as in aggregate or agglomerate, where majority of the particles are in the number size distribution, one or more external dimensions are in the size range of 1-100nm.ENMs based products, due to their novel physicochemicalcharacteristics,have wide range of applications in the industrial and consumer products viz., constructions, electronics, household appliances, personal care products, and biomedical etc.Increased application of NMs has raised new questions about theirrelease into the environmental matrices and their fate.Physico-chemical transformations in ENMs mayoccur upon their interactions with the natural environmental components (colloids, humic acid, organic matter etc.) or pollutants present in the environmental matrices. These transformations can significantly alter the nano-specific properties such as particle size, shape, surface chemistry etc. Transformed ENMs can behave differently than their pristine forms in terms of environmental fate and subsequent toxic properties to aquatic organisms. Available literature entails occurrence of ENMs in different environmental media and their adverse impacts on aquatic organisms and subsequently to humans via food chain. Worldwide regulatory agencies are working on formulating new norms for effective management of ENMs. So far, European Union has taken a lead on the regulations [REACH regulation (2018/1881)] for the management of Nano Material in environmental matrices and their toxic effects on aquatic organisms/humans. In it, REACHhas introduced “Nanoforms” in their amended technical annexes to specifically address nanomaterials. Considering the increasing threat pose by NMs, there is an urgent need of harmonized legislature for the management of nanomaterials/nanoforms in the environmental matrices.

Keywords: Engineered Nano Materials, Nanoforms, Transformation, Prevalence, REACH

P176: Identification and Abundance Study of Microplastics in the Surface Water Bodies of Solapur (MH), India

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Microplastic are plastic debris part which are usually in size of less than 5mm. The increasing concentration of microplastic is causing detrimental effect on Environment. The identification and quantification of microplastic is important for studying its abundance, distribution and chemical composition. This study focuses on identification and removal of microplastic from fresh water source above the earth surface i.e. River, lakes and swamps in Solapur. The Collection of microplastic with the neuston net (300 μm) mesh size at fresh water sources in Solapur. The surface water samples were transferred to the laboratory for advanced filtration and identification with stereo microscope. Further analysis is doneby Fourier-transform infrared (FTIR) spectroscopy to identify the constituents of the tested microplastic admixture plastic type. This study reveals the identification and abundance of microplastic in fresh water sources above the ground surface in Solapur area.

Keywords: Microplastics, Fresh Water Bodies, FTIR, Water Pollution, Aquatic life cycle

P 177: Coral Transplantation: Techniques for Habitat Restoration, Coral Gardening, Coastal Protection and Avenue for Blue Economy Investment in the Indian Context

Idrees Babu K K, Abdul Riyas C & Sureshkumar S

Lakshadweep archipelago has experienced multiple natural disturbances events, including bleaching and cyclone from 1998, 2003, 2005, 2010, 2016, and 2017. The results of the longterm reef monitoring call for proactive and progressive local strategies based on scientific rationality to manage individual ecosystems. We propose restoration techniques such as assisted evolution to enhance the performance of coral reef populations in response to current and future stressors. We propose to implement these restoration efforts into an ecotourism approach and beautify coastal development sites, providing additional value and rationale for ecotourism stakeholders to invest. The existing techniques of coral transplantation developed by the Department of Science & Technology, Union Territory of Lakshadweep, can be utilised to develop ecotourism and other blue economy projects. In this context, we discuss options for the pre-selection of corals and systematic, large-scale monitoring of coral genotype performance targeting higher resilience to future stressors. By restoring and strengthening the resilience of local populations, we believe this strategy will contribute to a net positive conservation impact, create a culture of restoration and enhance and secure blue economic investments that rely on healthy marine systems.

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