Ahmednagar Jilha Maratha Vidya Prasarak Samaj's

SHRI DHOKESHWAR COLLEGE

• Takali Dhokeshwar, Tal. Parner, Dist. Ahmednagar, Maharashtra, Pin - 414304 • Office(02488) 282414

National Conference on

"Frontiers of Sustainable Development in Science and Environment"

Organized by

Shri Dhokeshwar College,
Takali Dhokeshwar

Abstract Book

February- 2024

Website: shridhokeshwarcollege.com

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Ahmednagar Jilha Maratha Vidya Prasarak Samaj's

Shri Dhokeshwar College Takali Dhokeshwar

Affiliated to Savitribai Phule Pune University Pune,

"NAAC Reaccredited **B++** Grade (CGPA 2.86) (Cycle IIIrd)",

National Conference on

"Frontiers of Sustainable Development in Science and Environment"

(FSDSE- 2024)

24th February 2024

Organised By

Shri Dhokeshwar College
Takali Dhokeshwar
Dist. Ahmednagar, (M.S.) India 414 304

ABSTRACT BOOK

ABOUT COLLEGE

Shri Dhokeshwar College, Takali Dhokeshwar was established in 1994. It is affiliated with Savitribai Phule Pune University. The college is reaccredited with B^{++} grade by NACC. The college is recognized under 2(f) and 12(b) by the University Grants Commission, New Delhi. The college has Arts, Commerce and Science faculties. The college organizes various academic programs for the development of the students. The college provides access to higher education, especially for students who are economically backward and in hilly remote areas. The college strives to develop the all-around personality of students and hence is very keen to provide coaching in curricular, co-curricular, and extra-curricular activities. To provide for whole man is the objective of our institution. To be very modest, it won't be out of place to say that we have succeeded in achieving this goal to a certain extent.

MESSAGE FROM PRINCIPAL DESK

Prof. Dr. R. K. Aher

Principal,

Shri Dhokeshwar College
Takali Dhokeshwar

Dear Participants, I'm honoured to introduce the abstract book for the **"One Day National Conference on Frontiers of Sustainable Development in Science and Environment."**

Your diverse research and innovation on display here epitomize the dynamism of these fields. I'm very excited about the collaborative potential within these pages. It's an opportunity for knowledge sharing and cross-disciplinary. This conference represents the link between Current and Future research in the Environment. The intellectual discourse here will undoubtedly shape the future of these fields. I appreciate the organising committee, speaker authors, and reviewers for their invaluable contributions to this academic tapestry. Together, let's embrace the transformative power of science.

Warm regards,

MASSAGE FROM CO-ORDINATOR

Asst. Prof. Walhekar N. M
Co-Ordinator
Shri Dhokeshwar College,
Takali Dhokeshwar,

Dear authors and Contributors, I am so happy to introduce the abstract book for the conference. This book represents the collective knowledge and innovative research that you have all generously shared with us. It is a testament to the dedication and hard work that each of you has put into your respective fields. The abstract book is a valuable resource that will be shared with attendees, colleagues, and the broader academic community. It Serves as a platform to disseminate your insight, ideas and discoveries. I would like to express my gratitude to all of you for your active participation and for enriching this book with your expertise, and I am confident that they will inspire further exploration and advancement in your respective areas of research. Thank you for your dedication to the pursuit of knowledge and for making this conference a success.

Warm Regards

PREFACE

Welcome to the abstract book for the “National Conference on Current and Future Prospects in Life Science”. In these pages, you will discover a rich collection of abstracts that showcase the latest advancements in these fundamental disciplines. This conference is a testament to the dynamic nature of Life Science bringing together the brightest into current and prospects in Life Sciences. We extend our sincere appreciation to the organizing committee, speakers, authors, and reviewers for their invaluable contribution to this conference. Your dedication is instrumental in advancing knowledge in these fields. We encourage you to explore these abstracts. Embrace new ideas and cultivate collaboration that will shape in future of Life Science. This book is a testament to the intellectual favour and the endless possibilities that these disciplines offer. Thank you for being a part of this inspiring journey.

SCHEDULE OF THE CONFERENCE

08:00 am to 10:00 am	Registration and Breakfast
10:30 am to 11:15 am	Inauguration Function
	Inauguration Function Includes: Welcome and Felicitation of Guest Introductory Speech Inaugural Speech of Chair Person **Adv. DipLakshmi Mahse Patil** (Senior Trustee, A.J.M.V.P. Society **Chief Guest:- Dr. Ajay Thube** (Assistant Registrar Public Relation Office Savitribai Phule Pune University)
11:15 am to 12:00 pm	**Session 1st : Dr. Kirankumar Johare** Renowned International Meteorologist and Physicist, Department of Electronic Science, MVP's K.T.H.M. College, Nashik.
12:00 pm to 12 :45 pm	**Session 2nd : Dr. Balasaheb M .Gaikar** Head, Department of Botany Ahmednagar College, Ahmednagar
01:00 pm to 02:00 pm	**Lunch Break**
02:00 pm to 02:45 pm	**Session 3rd : Dr. D. R. Thube** Vice-Principal, NAC&S College, Ahmednagar
02:45 pm to 03:30 pm	**Session 4th** Paper Presentation by Participant
03:30 pm to 4:00 pm	Valedictory Function and Tea

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Identification and Characterization of *Klebsiella variicola* collected From Shevgaon , Ahmednagar

S. R. Adik & B. T. Pawar

Research Centre in Botany,

Shri Muktanand College,

Gangapur, Dist. Ch. Sambhajinagar (MS)

Email: sagaradik206@gmail.com

Abstract

Endophytic nitrogen-fixing bacteria *Klebsiella variicola* was collected from Shevgaon taluka of Ahmednagar district (MS). A total of 22 samples were collected from various localities of the taluka. Soil type, pH and Water Holding Capacity (WHC) of the collected samples were studied. After the isolation of bacteria from the sugarcane sample, Cell morphology and colony morphology of the collected bacterial samples were studied. With the help of special media and morphological characters preliminary identification of *Klebsiella variicola* was done. Out of these 22 bacterial strains, morphologically 15 bacterial strains were identical with *Klebsiella variicola* bacterial strains *viz.* SV01, SV02, SV03, SV04, SV06, SV08, SV09, SV11, SV12, SV13, SV15, SV16, SV17, SV19 and SV21 While 07 bacterial strains SV05, SV07, SV10, SV14, SV18, SV20 and SV22 were different from one another and they are grouped in Group-II. Colonies were creamy white, circular, small to large sized, opaque with smooth margins. *Klebsiella variicola* is able to increase nutrient supply, soil fertility and crop growth of sugarcane. The study of *Klebsiella variicola* will be useful for further researchers and it will be a better alternative for chemical fertilizers.

Key Words - *Klebsiella variicola,* Endophytic bacteria, Shevgaon, Ahmednagar.

Use of botanical insecticides for sustainable agriculture: Future perspectives

Mr. Chaudhari Somnath Aba
Shri Dhokeshwar College Takali Dhokeshwar, Tal- Parner, Dist- Ahmednagar,414302

Abstract

Recent decades have witnessed major growth in the use of agrochemicals worldwide, – for maximizing food production for a rapidly growing human population. However, the indiscriminate use of these substances, especially pesticides has led to the accumulation of toxic residues in food, soil, air, and water, as well as the development of resistance in pests. Moreover, pesticides affect soil enzymes, which are essential catalysts that govern soil quality. To meet food security, it is necessary to produce more food, sustainably and safely, in a diminishing area of available arable land and with decreased water resources. Given this situation, there is an increased interest in the use of alternative substances to synthetic agrochemicals that present less risk to the environment and human health while increasing food safety. Promising results have been obtained using compounds derived from aromatic plants for the control of agricultural pests.

Such compounds of botanical origin can be highly effective, with multiple mechanisms of action, while at the same time having low toxicity towards nontarget organisms. However, the large-scale application of these substances for pest control is limited by their poor stability and other technological issues. In this backdrop, the present work discusses perspectives for the use of compounds of botanical origin, as well as strategies employing the encapsulation techniques that can contribute to the development of systems for use in sustainable agricultural practices.

Biodiversity of Succulent Plants from Newasa Tehsil of Maharashtra

Tuwar A. R. and Arangale K. B*.

Department of Botany and Research Centre, Mula Education Society's, Arts, Commerce, and Science College Sonai, Tal. Newasa, Dist. Ahmednagar – 414105, Affiliated To Savitribai Phule Pune University, Pune (M.S.) India.

Email- kiranarangale@gmail.com.

Abstract

Information was gathered from knowledgeable medical professionals to study succulent plants in the Newasa tehsil region. Eight families, ten genera, and thirteen species were identified in the present investigation. All pertinent information regarding these species, including their botanical name, family, habitat, flowering and fruiting season, utilized plant part, and medicinal properties, including anti-inflammatory, antioxidant, antipyretic, anti-diabetic, and anticancer properties, was documented in this paper.

Keywords: Succulent Plants, Family, Genus, Antipyretic

Study of preliminary phytochemical analysis of *Plectranthus caninus.*

Kadam A.B[1]., Kamble S.A[2].

PG & Research Department of Botany, Shri Mukhtanand College Gangapur, Chhatrapati Sambhajinagar.
Corresponding Author Email I'd- kadamashok597@gmail.com

Abstract-

In nature many plants have medicinal value which are used in human life. *Plectranthus caninus* is a tropical perennial herb belonging to family Lamiaceae. The roots are perennial, while the shoots are annual. Stems are much branched, scented, hairy, fragile, and knotted at nodes. Leaves are thick, fleshy, ovate, hairy, with serrate margins. The plant has a very wide range of medicinal applications and is commonly harvested from the wild. It is cultivated for medicinal use in several countries including China, India and Brazil, is grown as a hedge and soil stabilizerin Africa and India, and is also sometimes grown as an ornamental. *Plectranthus caninus* is a evergreen perennial plant with stems that become more or less woody, it grows from a thick, tuberous rootstock. The branching stems are generally decumbent, rooting at the lower nodes where they touch the ground; the plant forms a clump of growth up to 75cm tall. It is nutraceutical product which have medicinal value in treatment like anticancer, antibacterial, antifungal, antidiaiabetes, leprosy, disinfection, antioxidant.

In the present investigation study secondary metabolites like phenol, flavonoids, alkaloid, saponin, glycosides, tannins, terpenoids, and steroids were present in *Plectranthus caninus.*

Key word- Plectranthus caninus, Phytochemical analysis, Secondary metabolites.

Study of phytochemical analysis and Antibacterial activity in *Caralluma fimbriata* Wall.

Dandekar S.D[1]., Bagal J.G[2].

1Tuljaram Chaturchand College of Arts, Science and Commerce Baramati

2. Department of Botany, Eknath Sitaram Divekar College, Varvand, Daund, Pune.

Corresponding Author Email I'd- sharaddandekar55@gmail.com

Abstract-

In nature, many plants have medicinal value which is used in human life. *Caralluma fimbriata* is a succulent perennial herb belonging to the family Apocynaceae. The *C. fimbriata* is a xerophytes plant present scarcity of water region. The average height of the plant is 20-30 cm tall stem is leafless fleshy green performs functions of photosynthesis. *C. fimbriata* normally caduceus leaves and flowers present on the stock petal are narrow and purple or red. The flowering period is June to August. *C. fimbriata* is used as a famine food and is consumed daily vegetable in Kolli Hills. Plants have been used for centuries to treat infectious diseases and are considered an important source of new antimicrobial agents. It is a nutraceutical product which has medicinal value in treatments like anticancer, antibacterial, antidiabetic, leprosy, disinfection, and antioxidant.

In the present investigation study secondary metabolites like phenol, flavonoids, alkaloid, saponin, glycosides, tannins, terpenoids, and steroids were present in *C. fimbriata.* Antibacterial activity *Bacillus cereus, E.coli, Bacillus substilis, Psudomonas aeruginosa* against *Bacillus substilis* root maximum zone of inhibition, *Bacillus cereus* shoot maximum zone of inhibition.

Key word- *Caralluma fimbriata*, Phytochemical, Secondary metabolites, Antibacterial.

Induced Mutagenesis and Variability Study in the M1 Generation of Pea *Pisum sativum* L.

***Zaware R. P, **Aher R. K,**

* Research Centre, Department of Botany, New Arts, Commerce and Science College, Parner, Dist- Ahmednagar, Maharashtra – 414 302, INDIA.

**Department of Botany, Shri Dhokeshwar College Takali Dhokeshwar, Tal- Parner, Dist- Ahmednagar, Maharashtra – 414 304, INDIA.

Email: * rzaware@gmail.com ** ragnathaher@gmail.com

Abstract

Peas are popular and preferred by growers as well as consumers for various uses. India ranks third in pea cultivation after Canada and Russia. Field pea (*Pisum sativum*) is a cool-season legume crop grown on 25 million acres worldwide. It is commonly consumed in the human diet throughout the world and has higher levels of amino acids (lysine and tryptophan) than cereals. A pot experiment was conducted to investigate the effect of gamma radiation on pea plants by exposing seeds to doses ranging from 0 to 30 KR and studying seed germination and seedling growth two weeks after irradiation. Doses above 10 KR significantly inhibited seed germination and seedling growth, and very few seedlings survived after irradiation at 15 KR and above. Morphological data showed that irradiated plants at 5 KR were significantly larger than the control while the rest of the treatments showed the opposite effect i.e. smaller than the control. These changes in plant development reflect radiation-induced genomic instability. The present work can help to improve this crop in terms of productivity and yield which is useful to meet the increasing demand.

Keyword:- Gamma rays, Mutation Breeding, Pea.

Fungicidal efficacy of Root Extract of *Xanthium strumarium* L. against Fungal Pathogens

Sangita D. Jadhav[1], Vijata B. Hase [2] and Samidha S. Halnar [3]

Department of Botany

Sangamner Nagarpalika Arts, D.J. Malpani Commerce and B.N. Sarda Science College, (Autonomous) Sangamner-422605 Ahmednagar (M.S)

Email: 1. hasevijata@gmail.com, 2. Jadhavsangita71@gmail.com

3.samidhahalnar@gmail.com

Abstract:

The study aimed to evaluate the fungicidal efficacy of root extracts of *Xanthium strumarium* L. plant against two fungal pathogens viz. *Rhizoctonia solani* and *Uromyces appendiculatus*. The plant was selected based on their reported ethanobotanical uses. Aqueous and methanolic root extracts of *Xanthium strumarium* L. plant were screened in-vitro for their fungicidal efficacy against two pathogenic fungi. The results showed that the methanolic (50.15 %) root extract of *Xanthium strumarium* was highly effective as compared to the aqueous (20.94 %) root extract. Between the two pathogenic fungi selected for study *U.appendiculatus* (63.66 %) was more susceptible than *R. solani* (36.98 %) against methanolic root extract.

Keywords- *Xanthium strumarium*, fungicidal efficacy, root extracts, effective, in-vitro.

Fungicidal efficacy of Root Extract of *Xanthium strumarium* L. against Fungal Pathogens

Sangita D. Jadhav[1], Vijata B. Hase [2] and Samidha S. Halnar [3]

Department of Botany

Sangamner Nagarpalika Arts, D.J. Malpani Commerce and B.N. Sarda Science College,

(Autonomous) Sangamner-422605 Ahmednagar (M.S)

Email: 1. hasevijata@gmail.com, 2. Jadhavsangita71@gmail.com

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Keywords- *Xanthium strumarium*, fungicidal efficacy, root extracts, effective, in-vitro.

Finger Millet: Good Source of Nutrition for 21st Century

T. S. Jagadale[1], D.D. Ahire[1] and S. G. Auti[2]

Email- tusharjagdale95@gmail.com

[1]Department of Botany, New Arts, Commerce and Science College, Ahmednagar (Autonomous) - 414 001.

[2]Department of Botany, HPT. Art's & RYK Science College, Nashik - 422 005.

Abstract:

The most significant small millet in the tropics is finger millet (*Eleusine coracana* L. Gaertn), which is grown in more than 25 nations. It is indigenous to rural poor populations and subsistence farmers. The finger millet seed has many nutrients that give rural residents energy and nourishment. The nutritional potential of millets is similar to that of famous cereals like rice, wheat, barley, or bajra in terms of protein, carbohydrates, and energy contents. This study aimed to analyse nutritionally enriched germplasm for future use. The twelve germplasm samples were gathered from various locations within the Palghar district of Maharashtra, India. The nutritional content (carbohydrate, protein and reducing sugar) were analysed proximally using the Association of Official Analytical Chemist standard procedures (AOAC). Average carbohydrates content recorded was 62.30 % with a ranged from 52.62% to 68.0%, Talichiwadi (Mokhada) germplasm has recorded highest carbohydrate content while Nandanmal (Javhar) recorded the lowest. It has been reported that finger millet has a protein content of 13.36 to 20.73 percent. The finger millet showed reducing sugar content ranged from 115.18 to 163.76 mg/gm and the average reducing sugar recorded 140.13 mg/gm. As a result, finger millet can be used as a substitute for other millets, improving nutritional value and acceptability by including a variety of foods in the diet.

Keywords: Potential, Germplasm, Reducing sugar, Nourishment

Effect of Foliar spray *of Arthrospira plantensis* (Spirulina) filtrate on Vegetative Growth, Yield of some leafy vegetables.

Dr. Khilari A.M and Dr.Sharma P.P

Radhabai Kale Mahila Mahavidyalaya, Ahmednagar
anjalikhilari@gmail.com
Shri.Muktanand College, Gangapur.

Abstract:

Arthrospira plantensis is filamentous cyanobacteria which are used as a biofertilizer in agricultural field for their potential role in safeguard and sustainable crop production, the use of algae as biofertilizers or biostimulants is one of the most pioneering agronomic techniques as an substitute to chemicals, the biological approaches stimulate a widespread range of use of plant growth promoting cyanobacteria and many other useful microscopic organisms lead to enhanced nutrient uptake, plant development and plant tolerance to abiotic and biotic stress, a field research was conducted during successive seasons foliar spray of *Arthrispira platensis* extract on vegetative growth and development on leafy vegetables like *Spinacia oleracea* (spinach) and *Trigonella foenum-graecum (*Methi*)* yield outcome indicated that treatments resulted had significant increases promoted growth characters, leaves and roots as compared to the control treatment.

Key Words: Bio-fertilizer, Plant growth, *Arthrospira platensis* (spirulina), leafy vegetables, foliar spray *Spinacia oleracea, Trigonella foenum-graecum* etc

Identification and Characterization of *Klebsiella variicola* collected From Shevgaon , Ahemednagar

S.R. Adik & B.T. Pawar
Research Centre in Botany,
Shri Muktanand College,
Gangapur, Dist. Ch. Sambhajinagar (MS)
Sagaradik206@gmail.com

Abstract

Endophytic nitrogen-fixing bacteria *Klebsiella variicola* was collected from Shevgaon taluka of Ahmednagar district (MS). Total 22 samples were collected from various localities of the taluka. Soil type, pH and Water Holding Capacity (WHC) of the collected samples were studied. After the isolation of bacteria from the sugarcane sample, Cell morphology and colony morphology of the collected bacterial samples were studied. With the help of special media and morphological characters, preliminary identification of *Klebsiella variicola* was done. Out of these 22 bacterial strains, morphologically 15 bacterial strains were identical with *Klebsiella variicola* bacterial strains *viz.* SV01, SV02, SV03, SV04, SV06, SV08, SV09, SV11, SV12, SV13, SV15, SV16, SV17, SV19 and SV21 While 07 bacterial strains SV05, SV07, SV10, SV14, SV18, SV20 and SV22 were different from one another and they are grouped in Group-II. Colonies were creamy white, circular, small to large sized, opaque with smooth margins. *Klebsiella variicola* can increase nutrient supply, soil fertility and crop growth of sugarcane. The study of *Klebsiella variicola* will be useful for further researchers and it will be a better alternative for chemical fertilizers.

Key Words - *Klebsiella variicola,* Endophytic bacteria, Shevgaon, Ahmednagar.

Impact of water treatments on phytochemicals and mineral (Potassium) concentrations in Banana peels

Rushikesh A. Labade and Narayan M. Ghangaonkar

Corresponding Author e-mail: rushilabade52@gmail.com

Post-graduate and Research Center, Department of Botany, Chandmal Tarachand Bora College of Arts, Commerce and Science, Shirur- Ghodnadi, Dist. Pune-412210.

Abstract:

Banana (*Musa* sp.), a globally consumed fruit belonging to the family Musaceae, faces significant environmental challenges due to the disposal of its peels as solid waste. Widespread discard of banana peels contributes to escalating agricultural waste and environmental problems, emphasizing the need for sustainable disposal solutions. This research investigated the impact of cold and hot water treatments on the phytochemicals and mineral composition of fresh and dried unripen banana peels. In this investigation different types of phytochemicals like Tannins, Phytosterols, Phenols, Terpenoids, and Resins were detected. Alkaloids, Carbohydrates, Reducing sugar, Glycosides, Saponins, and Steroids were totally absent. Mineral (Potassium) concentrations varied with both treatments in dry peels and fresh peels. These findings provide insights into the effects of water treatments and drying on banana peel composition. The further studies on effect of water treatment on phytochemicals and mineral can leads to develop a novel byproducts, dietary supplements and pharmaceutical applications.

Key Words: Preliminary screening, Secondary metabolites, Banana peels, Agricultural waste, Potassium analysis.

Formulation and Evaluation Nutraceutical Dosage form of Corn Silk *(Stigma maydis)*.

Wagh N.G.*, Ghanwat S. P.

[1.]Department of Botany and Research Centre, Mula Education Society's, Arts, Commerce & Science College Sonai, Tal. Newasa, Dist. Ahmednagar. 414105,
(Affilated to Savitribai Phule Pune University Pune).

[2.]Department of Botany, Shri Dnyaneshwar Mahavidyalaya, Newasa, Tal. Newasa, Dist. Ahmednagar. 414603.

Email – nileshwagh6809@gmail.com

Abstract:

The significant herb corn silk (*Stigma maydis*) has long been employed by Native Americans and Chinese medicine practitioners to cure a wide range of illnesses. It is also used as a traditional medicine in numerous countries, including France, the United States, and Turkey. Possibilities Numerous investigations have indicated the potential benefits of antioxidants in healthcare applications, including as a diuretic agent, to reduce hyperglycaemia, as an antidepressant, and to combat weariness. Teas and supplements for the treatment of urinary tract issues are some more uses for maize silk. The characteristics and mode of action of the plant's bioactive components, such as terpenoids and flavonoids, are closely linked to the possible application. Corn silk has long been thought of as a waste product, however, due to its numerous therapeutic attributes. It has remarkably gained popularity in Asian countries. The main aim of preparing this formulation is to improve overall health, increase farmer economies, and promote nutraceutical products.

Keywords: Corn silk, Nutraceutical.

Organic Farming: A Sustainable Agriculture Practice

Pushpa Ghogare[1] and Rangnath Aher[2]

1, Research Centre, Department of Botany, New Arts, Commerce and Science College, Parner, Dist- Ahmednagar, Maharashtra – 414 302, INDIA.

2. Department of Botany, Shri Dhokeshwar College Takali Dhokeshwar, Tal- Parner, Dist- Ahmednagar, Maharashtra – 414 304, INDIA.

Abstract

Stress innovative methods that promote biodiversity, soil health, and cost-effective resource use, such as organic farming, agroforestry, and precision agriculture. Because it focuses on techniques that encourage biodiversity, healthy soil and economic resource utilization. The field of sustainable agriculture is fascinating. Some of the most innovative farming methods used in this field are organic farming, precision agriculture, and agroforestry. For organic agriculture, the method emphasizes using natural means to cultivate crops and raise livestock. GMOs, pesticides, and artificial fertilizers are avoided. Rather, crop rotation, composting, and biological pest management are the mainstays of organic farming, which helps to maintain soil health and lessen environmental impact.

The agroforestry technique combines farming with tree and shrub cultivation. Agroforestry, or the use of trees in agricultural systems, has many benefits. Trees improve soil erosion control, provide shade for crops, and retain more water. They also promote biodiversity and can bring in additional revenue from the sale of products like nuts, fruits, and lumber. Precision farming employs cutting-edge technologies, this approach maximises the utilisation of the available resources. Farmers can use GPS, remote sensing, and data analytics to apply pesticides, fertiliser, and water with precision. By delivering inputs only where they are most required, precision agriculture maximises efficiency, minimises waste, and has a negligible negative environmental impact. By applying these sustainable farming methods, we can preserve soil health, protect biodiversity, and maximise the use of available resources. This benefits the environment and ensures the agriculture sector's long-term viability. The application of precision agriculture is fraught with several challenges. Common difficulties that people run with are as Price: Precision agriculture sometimes requires large upfront investments in gear, software, and data management systems. Small-scale farmers or those with limited resources could encounter difficulties because of this. Education and Training: To apply precision agriculture practices, farmers need to have a certain level of

technical knowledge and proficiency. It could be difficult for some farmers to use and interpret data from sensors, GPS devices, and other technologies. Data management: Precision agriculture generates a lot of data, including soil samples, yield maps, and sensor readings. The management and analysis of this data may require a significant investment of time and resources, as well as specialized tools. Infrastructure and Connectivity: Precision agriculture needs a robust and consistent internet connection for remote monitoring and real-time data transfer. However, not all rural areas have rapid internet access, which may limit the value of precision agriculture technologies. Compatibility and Integration: Combining precision agriculture technologies and equipment from many vendors might be challenging. It might be difficult for farmers to make sure hardware and software systems integrate properly. Despite these challenges, precision agriculture offers significant benefits in terms of resource optimization, increased productivity, and reduced environmental impact. As technology and awareness advance, these challenges are being solved, making precision agriculture more accessible and effective for farmers.

Keywords: Sustainability, organic farming, innovative approach, Agroforestry

Blue Green Algae Like Cyanobacterial Diversity and Abundance in Maize Field of Ahmednagar District (M.S.) India

Swati G. Wagh

Department of Botany, Arts, Science and Commerce College, Burhannagar,

Tal. & Dist. – Ahmednagar, Pin code- 414002. (M. S.) India.

Email- swati.wagh375@gmail.com

Abstract

Blue-green algae is a diverse group of plant kingdoms. They are found in a variety of terrestrial habitats. Cyanobacteria is one of the significant components of soil microflora. They fix atmospheric nitrogen and increases the fertility of soil. Most of the species of cyanobacteria help in retention of soil moisture and provides germination ground for the seeds of flowering plants. The cultivated field ecosystem provides favorable ground for the growth and development of Cyanobacteria. The present paper deals with the cyanobacterial flora of Maize (*Zea mays L.*) field, located in the Shrirampur tahsil area of the Ahmednagar district of Maharashtra. Cyanobacterial samples were collected at weekly intervals from the moist soil surface of selected field. The work was carried out from July 2017 to October 2017. Bold's basal medium was also to culture cyanobacteria from the soil of the Maize field. Collected and cultured cyanobacterial forms were observed and identified. A total of 32 species under 15 genera were identified and recorded. Cyanobacterial taxa such as *Aphanothece nidulans, Myxosarcina burmensis, Oscillatoria obscura, Oscillatoria subbrevis, Microcoleus acutissimus* and *Nostoc punctiformae* were found dominant. Selected Physico-chemical parameters show positive correlation with diversity and abundance of cyanobacterial flora.

Key words: Cyanobacteria, Maize field, Physico-chemical parameters.

Fungicidal efficacy of Root Extract of *Xanthium strumarium* L. against Fungal Pathogens

Sangita D. Jadhav[1], Vijata B. Hase [2] and Samidha S. Halnar [3]

Department of Botany

Sangamner Nagarpalika Arts, D.J. Malpani Commerce and B.N. Sarda Science College, (Autonomous) Sangamner-422605 Ahmednagar (M.S)

Email: 1. hasevijata@gmail.com, 2. Jadhavsangita71@gmail.com

3.samidhahalnar@gmail.com

Abstract:

The study aimed to evaluate the fungicidal efficacy of root extracts of *Xanthium strumarium* L. plant against two fungal pathogens viz. *Rhizoctonia solani* and *Uromyces appendiculatus*. The plant was selected based on their reported ethanobotanical uses. Aqueous and methanolic root extracts of *Xanthium strumarium* L. plant were screened in-vitro for their fungicidal efficacy against two pathogenic fungi. The results showed that the methanolic (50.15 %) root extract of *Xanthium strumarium* was highly effective as compared to the aqueous (20.94 %) root extract. Between the two pathogenic fungi selected for study *U.appendiculatus* (63.66 %) was more susceptible than *R. solani* (36.98 %) against methanolic root extract.

Keywords- *Xanthium strumarium*, fungicidal efficacy, root extracts, effective, in-vitro.

Effect of Dilution on the Thermodynamic Parameters of some Transition Metal Salt by Viscosity Method

Santosh B Rathod*

Department of Chemistry

Hon. Balasaheb Jadhav Arts, Commerce & Science College, Ale, Tal. Junnar, Dist. Pune, Maharashtra (India)

Abstract

The physical properties such as density, and specific viscosity of $MnCl_2$, $CuCl_2$ and $CoCl_2$ at different concentrations in the range ($1X10^{-2}$ M to $6X10^{-4}$ M) in aqueous medium at temperature 299K, 305K and 311K were reported. The experimental data shows, the effect of concentration of solute on viscosity in aqueous medium revels the idea about the different types of molecular interactions present in different solutions. Desired molecular interactions have been observed between the salts of chloride such as Mn^{2+}, Cu^{2+} & Co^{2+} and water.

The thermodynamic parameters such as ΔH, ΔG & ΔS for the dissolution of $MnCl_2$, $CuCl_2$ and $CoCl_2$ were calculated from values of viscosity and densities at different temperatures such as 299K, 305K and 311K in aqueous medium. The experimental data gives the idea about effect of temperature on the molecular interaction and structural changes in solute.

Keywords: Viscosity, Density, Thermodynamic Parameters, Thermodynamic Parameters ΔH, ΔG and ΔS, Chloride Salt of Mn^{2+}, Cu^{2+} & Co^{2+}.

Synthesis & Characterization of 1,8 dioxo- octahydroxanthenes using Biopolymer catalyst XPA

[1]Narsale B. S., [2]Thube D. R., [3]Mhaske S. D., [4]Dhole A. J. &[5]Daule P. N.

[1,3,4,5]Department of Chemistry and Research Center, New Arts, Commerce and Science College, Parner, Ahmednagar, Maharashtra, India, narsale_bs@rediffmail.com

[2]Department of Chemistry and Research Center, New Arts, Commerce and Science College, Ahmednagar, Maharashtra, India, narsale_bs@rediffmail.com

Abstract

A simple & eco-efficient method has been developed for one-pot multicomponent synthesis of Antiviral and antibacterial agent 1,8 dioxo-octahydroxanthenes. This is reactions between aldehyde & dimedone in presence of water- alcohol as solvent, at reflux condition.

The recyclable catalyst (XPA) gives a high atom efficiency within short time duration. The prepared xanthene derivatives are characterized by spectroscopic techniques. Further advantages of this methodology include excellent yield, mild reaction condition, environmental friendly and reusable catalyst.

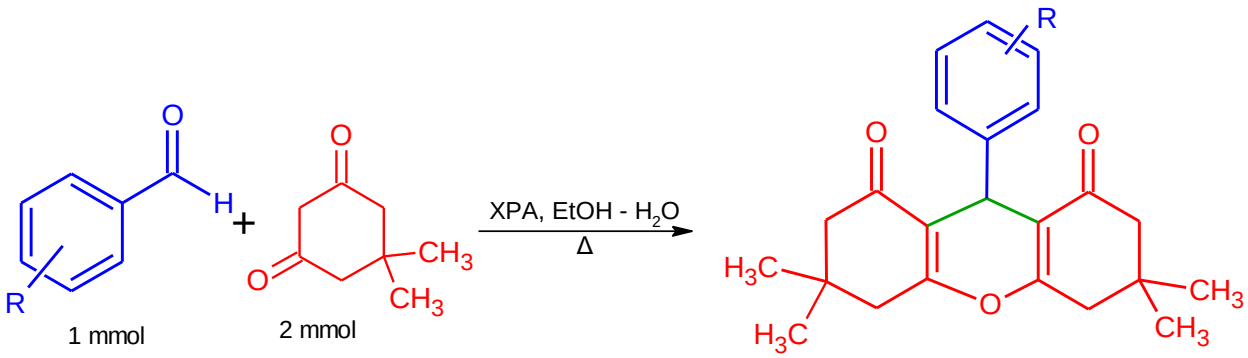

Figure 1. Synthesis of Xanthenes

Key Words: Xanthene, XPA catalyst, green chemistry.

Applications of Novel XPA catalyst in synthesis of Pyrrole derivatives

[1] Mhaske S. D., [2]Thube D. R., [3]Narsale B. S. & [4]Dhole A.J. [5]Daule P.N.
[1,3,4,5]Department of Chemistry and Research Center, New Arts, Commerce and Science College, Parner, Ahmednagar, Maharashtra, India, sagarmhaske2000@gmail.com
[2]Department of Chemistry and Research Center, New Arts, Commerce and Science College,
Ahmednagar, Maharashtra, India,

Abstract

A simple & efficient method has been developed for one-pot multicomponent synthesis of Pyrrole derivatives. This was achieved through Aldol Condensation followed by Michael addition reaction between aldehydes & malononitrile in presence of ethanol-water as solvent for 90 min at reflux condition. The Novel Xanthene Perchloric Acid (XPA) catalyst is employed in this methodology gives excellent yield, mild reaction conditions, environment friendly, and reusable catalyst. The products are characterized using spectroscopic techniques viz. FT-IR and NMR.

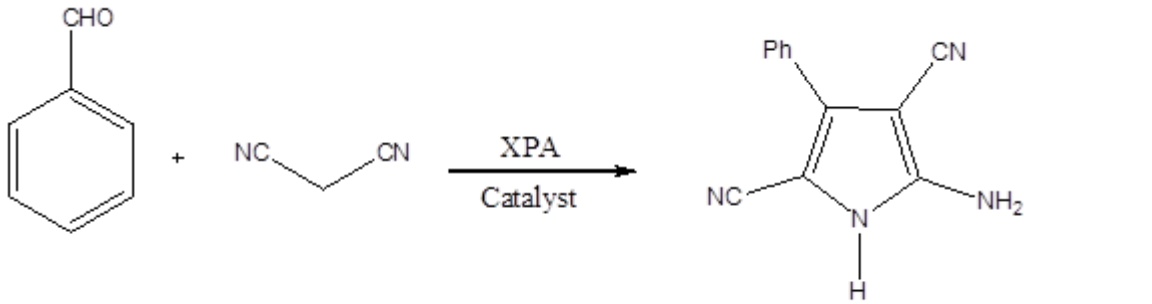

Figure 2. Synthesis of Pyrrole

Key Words: Pyrrole, Aldol Condensation, Michael addition, XPA

General Purpose of Catalysis in Green Chemistry

Dudhade Vaishnavi Raosaheb, Mundhe Ganesh Nana, T. S. Thopate*

New Arts, Commerce and Science College, Parner, Ahmednagar, Maharashtra – 414 302, INDIA.

Abstract

Catalysis is a key principle of green chemistry. Catalysts lower the activation energy needed for a reaction to occur, which means we can use lower temperatures and pressures. This not only saves energy but also reduces waste and makes the process more energy-efficient and environmentally friendly. So, catalysis plays a crucial role in making chemical reactions greener and more sustainable approach.

Transition metals catalysts such as nickel, palladium, and platinum are more frequently used in various reactions due to their ability to facilitate the chemical transformations efficiently. The biological catalysts, enzymes are derived from living organisms play a crucial role especially in the field of biocatalysis. Homogeneous Catalysts exist in the same phase as the reactants and are often used in liquid-phase reactions. The acids, bases and certain metal complexes serves as homogeneous catalyst. But heterogeneous Catalysts are worked in a different phase from the reactants and are commonly used in solid-phase reactions. The metal oxides, zeolites, and supported metal catalysts are the examples of this type of catalysts.

Key Words: Catalysis, Chemical reaction, Green chemistry.

Role Of Green Chemistry: The Sustainability of an Innovative Approach.

Mundhe Ganesh Nana, Dudhade Vaishnavi Raosaheb, T. S. Thopate*

New Arts, Commerce and Science College, Parner, Dist-Ahmednagar, Maharashtra– 414 302, INDIA.

Abstract

Green Chemistry explores how scientists are developing environmentally friendly alternatives to traditional chemical processes, reducing waste and minimizing the use of hazardous substances. Green chemistry plays a crucial role in promoting sustainability. By developing an environmentally friendly alternative to traditional chemical processes, it helps to reduce the negative impact of chemical production and use on the environment and human health. Green chemistry aims to minimize the use of hazardous substances and reduces the waste generated. By adopting cleaner and greener processes, it helps to protect ecosystems, air quality, water resources, and soil health. Green chemistry also focuses on maximizing the efficiency of chemical reactions, reducing the need for raw materials and energy. This leads to the conservation of natural resources, including fossil fuels and non-renewable feed stocks. By replacing toxic solvents, catalysts, and chemicals with safer alternatives, green chemistry reduces the risk of exposure to hazardous substances for workers, consumers, and the general public. It promotes the well-being of both people and the environment. Green chemistry can lead to cost savings in the long run. By optimizing processes, minimizing waste, and reducing the need for expensive hazardous materials, it can enhance the economic viability of chemical production while also benefiting the environment. Green chemistry encourages innovation and collaboration among scientists, engineers, and industry professionals. It fosters the development of new and sustainable technologies, creating opportunities for economic growth and job creation. Overall, green chemistry provides a framework for sustainable chemical practices, promoting a balance between economic growth, environmental protection, and human well-being. It's an essential component of building a more sustainable future for our planet. Green chemistry is a fascinating field that focuses on developing sustainable and environmentally friendly chemical processes. Scientists in this field aim to find alternatives to traditional methods that minimize the use of hazardous substances and reduce waste. They explore innovative ways to design and produce chemicals that are less harmful to human health and the environment.

Keywords: green chemistry, sustainability, innovative approach.

Municipal solid waste management

S.T.Tambe

Assistant Professor, Department of Chemistry

Shri Dhokeshwar College, Takali Dhokeshwar 414304

Abstract

The India, the USA, and China are the top three producers of municipal solid waste. The composition of solid wastes varies with income: low-to-middle-income population generates mainly organic wastes, whereas high-income population produces more waste paper, metals and glasses. Management of municipal solid waste includes recycling, incineration, waste-to-energy conversion, composting or landfilling. Landfill sites act as ecological reactors where wastes undergo physical, chemical and biological transformations. Landfilling for solid waste disposal is preferred in many municipalities globally. Hence, critical factors for sustainable landfilling are landfill liners, the thickness of the soil cover, leachate collection, landfill gas recovery and flaring facilities. Here, we review the impact of landfill conditions such as construction, geometry, weather, temperature, moisture, pH, biodegradable matter and hydrogeological parameters on the generation of landfill gases and leachate. Bioreactor landfills appear as the next-generation sanitary landfills, because they augment solid waste stabilization in a time-efficient manner, as a result of controlled recirculation of leachate and gases. We discuss volume reduction, resource recovery, valorization of dumped wastes, environmental protection and site reclamation toward urban development. We present the classifications and engineered iterations of landfills, operations, mechanisms and mining.

Evaluation of Chemical Constituents in Selected Energy Drink

Ms.Archana Thube[1] Ms.Karishma Sayyed[2] Ms. Pallavi Yewale[3]
(Department of Chemistry, Dr. D. Y. Patil Arts Commerce and Science College Akurdi, Pune)

Abstract -

This research paper presents an extensive examination of the chemical components found in a commercially available energy drink and investigates their potential impact on consumer health. The chosen energy beverage, widely consumed for its alleged energy-boosting properties, underwent a thorough assessment using various analytical techniques. The targeted components encompassed caffeine, sugar, taurine, vitamins, amino acids, herbal extracts, preservatives, additives, electrolytes, and alcohol. The methodology comprised precise sample collection and preparation, employing advanced analytical methods such as High-Performance Liquid Chromatography (HPLC), Gas Chromatography (GC), and Ion Chromatography (IC). The outcomes provided quantitative data for each identified chemical constituent, elucidating the intricate composition of the formulation. The ensuing discussion interprets the findings within the context of existing literature, exploring the physiological implications and potential health concerns linked to the observed chemical profile. Particular attention is directed towards instances of surpassing regulatory limits and the cumulative health effects arising from the combination of constituents. Despite inherent limitations, this study significantly contributes to comprehending the complexities of energy drink formulations and their potential impact on consumer well-being. The aim of this research is to conduct a comprehensive analysis of the chemical constituents present in a commercially available energy drink, with a focus on understanding their potential impact on consumer health and objective of our study is to identify and quantify the specific chemical components present in the selected energy drink, including but not limited to caffeine, sugar, taurine, vitamins, amino acids, herbal extracts, preservatives, additives, electrolytes, and alcohol. To provide recommendations for raising awareness among consumers, establishing stringent regulatory frameworks, and encouraging further research to delve into the long-term health effects of regularly consuming energy drinks. For this study Collect representative samples of the energy drink from different batches or lots to account for variability. Ensure proper labelling, storage, and transportation to prevent contamination or degradation. Sample Preparation: Homogenize the samples to ensure a representative composition. Depending on the analysis, employ appropriate sample preparation techniques such as dilution, filtration, or extraction to isolate specific compounds. Choose suitable analytical techniques based on the targeted chemical constituents. Common techniques include:

- High-Performance Liquid Chromatography (HPLC)
- Gas Chromatography (GC)
- Mass Spectrometry (MS)
- Nuclear Magnetic Resonance (NMR)
- UV-Vis Spectrophotometry
- Validate and calibrate instruments to ensure accuracy and precision.

In conclusion, the research underscores the significance of informed consumption and regulatory oversight in the energy drink market. Recommendations include enhancing consumer awareness, implementing rigorous regulatory frameworks, and promoting additional research to explore the long-term health effects of regular energy drink consumption. The systematic evaluation of chemical constituents in the selected energy drink provides a comprehensive understanding of its composition, safety, and quality. The results can inform consumers, regulators, and manufacturers, contributing to the ongoing improvement of energy drink formulations and ensuring adherence to safety standards.

Key Words – Chemical constituents, High-Performance Liquid Chromatography (HPLC), Chromatography GC, energy drink, quantitative data,

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Key Words – Chemical constituents, High-Performance Liquid Chromatography (HPLC), Chromatography GC, energy drink, quantitative data,

Measurement of rainwater and accordingly water management and crop management around the area of Sangamner Tehsil (MS)

Lende Rajendra Kashinath , Khemnar Mahtu Tatyaba
Katore Lakshiman Damu , Harde Harshda Namdev
Shirsath Vrushali Sudam

Abstract

The success of agricultural production depends on the volume and distribution of rainfall. For arranging agricultural operations, weekly, monthly, and seasonal rainfall data are particularly helpful. In light of this, an effort has been made to assess rainfall distribution patterns, including weekly, seasonal, and annual rainfall, using data from period (2020-2021). Although the most average rainfall of 55 mm was observed in 20th week had, the monthly rainfall study revealed that the maximum value of average monthly rainfall (106 mm) and the minimum value (12 mm) were recorded in August and November, respectively. It typically loses a significant portion through runoff, which can be kept in in-situ or ex-situ water harvesting facilities and used for growing crops in the Kharip, Rabi, and summer seasons. It can also be used as lifesaving irrigation, particularly during the dry period of one or two weeks during the rainy season, which also has a negative impact on standing Kharip crops. As a result, the useful data collected from the analysis of rainfall in the current study can be applied to crop planning and the creation of soil and water conservation structures in the sangamner tahsil.

Keywords: India's agriculture, environmental quality, water management, Rainfall, Sangamner tahasil (MS),Crop planning.

Introduction

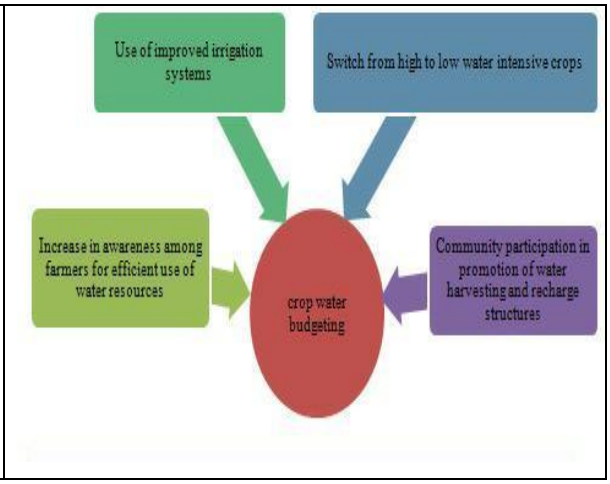
The planning for agricultural development in rain fed agro-ecosystems is frequently made more difficult by the region's restricted access to irrigation and its highly variable agro climatic conditions. This anticipates appropriate study of rainfall for resource management. The sectors of agriculture and water in India are perhaps the ones most vulnerable to the effects of climate change. Unpredictable rainfall patterns that result in unstable agricultural yields are also what cause drought. Depending on circumstances at present, several analyses of the rainfall data are required. The south-west monsoon contributes 85% of the rainfall from June to September, and the remaining 15% comes from the north-east summer and winter seasons, giving rise to an average annual rainfall of 1200-1400 mm and 65 wet days

(Bhuarya, 2015). Globally, per capita fresh water availability is a key challenge as the world's population continues to grow (Mall *et al*., 2006). By 2025, India's annually per capita water availability is expected to diminish to the point of water scarcity (Poddar *et al*., 2014). Apart from that, rising food demand, non-agricultural water use and global climate change, have put a strain on already restricted water supplies (Rosegrant *et al*., 2009). Water auditing is a comprehensive examination that allows for more efficient and effective management of scarce resources with improved reliability (Broker, 2017).

Materials and Methods:-

It is required to estimate crop water requirements as well as water requirements for agricultural crop . water availability for various crops, and water surplus/deficit for the current cropping plan in order to estimate water avaibility at the village level. Ronald and Debra (2005) also proposed a method for calculating water budgets in agriculture at the village level. The standard methodology for water auditing was also jointly developed byAmerican Water Works Association (AWWA) and International Water Association (IWA) in 2000 in worksheet format

Raingauge	**Domastic Raingauge**
	
Measurment of water Resource	**Objectives**



Result and Conclusion:-

The seasonable rainfall in the khandarmal village is 275 mm. Where the weekly report is observed the minimum rainfall is 6 mm and the maximum rainfall is 25 mm according to the raingauge.so management of water is necessary for seasonal crop planning. The daily report is recorded by the rain gauge. Underground water measured by the help of water sources (the well). Also measured the well water level by measuring tap after and before irrigation of water. After the recorded of water, the water management is easy and predictable. The water budgeting and auditing helps in providing a scientific foundation for evidence-based strategy building, operational decision-making and awareness-raising campaigns among rural people for crop planning and management.

Weakly report

Date	Rainfall (mm)
18/05/2021	6 mm
30/05/2021	25 mm
01/06/2021	17 mm
02/06/2021	22 mm
05/06/2021	08 mm
19/06/2021	10 mm
21/06/2021	6 mm

Seasonable report

Sesion (months)	Rainfall (mm)
may	31 mm
jun	78 mm
jully	106 mm
august	12 mm
september	48 mm

Referance :-

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"Identification, Synthesis and Characterization of Potential Process Related Compounds of Polmacoxib"

Macchindra B. Kadam[1,2], Padi Pratap Reddy[2] and Sayujjata R. Vaidya[1]*

[1]Department of Chemistry, Vivekanand Arts , Sardar Dalipsingh Commerce and Science college, Samarthnagar, Aurangabad 431004, Maharashtra, India.

[2]Chemical Research and Development, Macleods Pharmaceuticals Ltd., Plot No-124, Road No. 17, MIDC, Marol Industrial Area, Andheri East, Mumbai 400093, Maharashtra, India.

Abstract:

The present development relates to a drug substance Polmacoxib (7) containing three potential process related impurities and these are detected during the impurity profile study of the drug substance Polmacoxib.

The first time synthesized compounds were identified by different characterization techniques like HPLC, Mass, IR, 1H NMR, and 13C NMR, and further these compounds named as 4-(3-Fluorophenyl)-2,2-dimethyl-5-(4-(methylsulfonyl)phenyl)furan-3(2H)-one (2a), ((4-(3-(3-Fluorophenyl)-5,5-dimethyl-4-oxo-4,5-dihydrofuran-2-yl)phenyl)sulfinyl)methyl acetate (4a) and 4-(3-(3-Fluorophenyl)-5,5-dimethyl-4-oxo-4,5- dihydrofuran-2-yl)benzene sulfonic acid (7a). (Scheme 1) The present work describe our detailed investigations on the structural characterization of Polmacoxib API impurities, and further their independent synthesis with a remarkable scope in good to excellent yields and purity.

KEYWORDS:

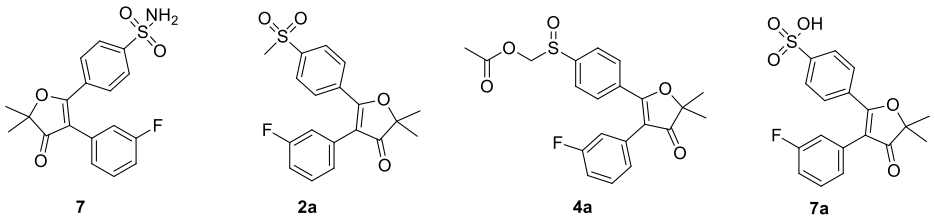
Polmacoxib, Methyl sulfone, Hydroxy, Des amino Methyl Acetate, Process related substances, impurities.

INTRODUCTION

Polmacoxib, CG-100649, chemically known as 4-(3-(3-Fluorophenyl)-5,5-dimethyl-4-oxo-4,5-dihydrofuran-2-yl)-benzenesulfonamide had been developed by Crystal Genomics under the trade name Acelex® at KR. Dong-A ST, South Korea and TR-Pharm have licensed of Polmacoxib API for commercialization in Turkey and

Middle East and North Africa region. It is a nonsteroidal anti-inflammatory drug (NSAID - is a class of medicine that reduce inflammation with relieving pain and fever) and is developed by the Korean Ministry of Food and Drug Safety (MFDS) on 2015. It is a cyclooxygenase 2 (COX-2) inhibitor that specifically blocks COX-2 enzymes, and used in the treatment of osteoarthritis. Acelex® is now available as capsules for oral use, and recommended dose of Polmacoxib is 2 mg once a daily.[1-8]

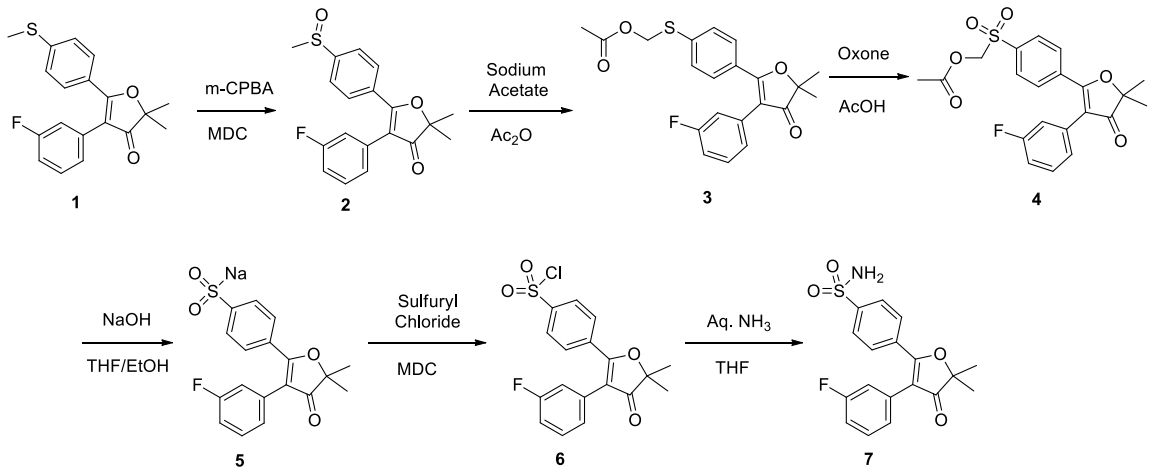
During the purity analysis of different laboratory batches of Polmacoxib, three unknown impurities with area percentage ranging from 0.02%-0.15% was detected



by using a simple HPLC method. (Scheme 1)

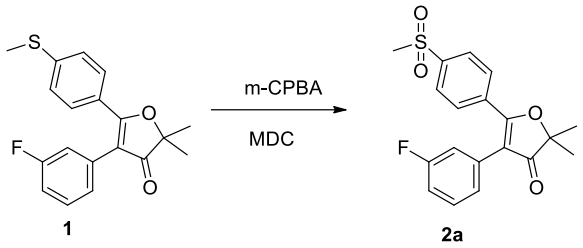
Scheme 1. Structure of Polmacoxib with other compounds.

Generally, it is essential to recognize and characterize the unknown impurities for increasing the limit in the specification from 0.1 to 0.15% level, and control it during the preparation of the active pharmaceutical ingredient (API) as per ICH (International Conference on Harmonization) guidelines.[9-15] There are several methods reported in the literature for the preparation of Polmacoxib[16,17], but the related substances synthesis was not discussed. Therefore, this impurity profile study is very important for the process development chemist to understand the formation of probable impurities during the synthesis of API drug substance. In the present work three process related impurities of Polmacoxib were synthesized and characterized using spectroscopic techniques. The general route of synthesis of Polmacoxib is shown in Scheme 2.

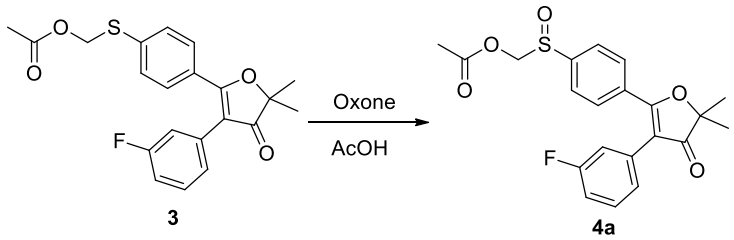


Scheme 2. Synthesis of Polmacoxib

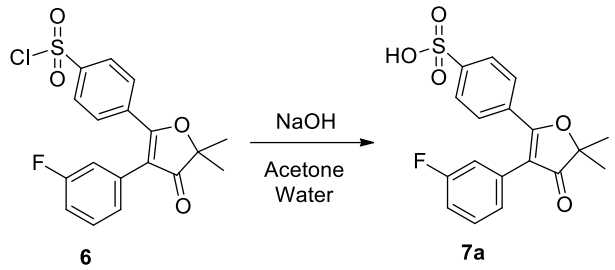
In summary, herein we have demonstrated an efficient, simple, green, economical and environmentally benign procedure for synthesis of Polmacoxib API related impurities like **2a**, **4a** and **7a**.



Scheme 3. Synthesis of Polmacoxib methane sulphone impurity (2a)



Scheme 4. Synthesis of Polmacoxib des-amino methyl acetate impurity (4a)



Scheme 5. Synthesis of Polmacoxib hydroxy impurity (7a)

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Environment and Science Importance and Challenges

Prof.S.A. Veer M.Com, M.Phil, Ph.D

Shri. Dhokeshwar College, Takali Dhokeshwar Tal.Parner, Dist-Ahmednagar

After understanding what environmental science is, students must figure out its importance. Environmental science is crucial for the following reasons: To figure out a more sustainable way of living. Understanding the behavior exhibited by organisms under some natural conditions. Educating and making people aware of different environmental issues and problems. Using natural resources in an effective manner without causing any harm to the environment. Teaching human beings how important environmental conservation is for the rest of humanity.

There are some other branches of environmental science such as atmospheric science that deals with the atmosphere of the Earth. Ecology is another branch of environmental science that focuses on the interaction of organisms with our environment. It also teaches the impact of certain environmental factors such as water and air pollution on the environment.

Keywords – Behavior, Environment, Pollution

Scope of Studying Environmental Sciences

Dr.Gaikwad Vijay Vishnu

Head of Department Commerce

Jijamata Senior College Jategaon Bk, Tal.Shirur, Dist-Pune

Abstract

Environmental science is sometimes also called environmental engineering. It is one of the most prominent fields of study that students opt for these days. The basic definition of environmental science consists of fields such as ecology, biology, chemistry, geology, and much more. It is an interdisciplinary field and that is because it consists of different aspects of social science as well as humanities too.

Apart from studying the physical and biological aspects of different characteristics of the environment, this field also consists of certain cultural and social impacts that humans have made on the environment today. Hence, students need to delve into environmental science study to understand what factors affect the environment.

To know what is environmental science, one has to understand how it is different from environmental studies. Environmental science can be defined as a quantitative discipline that has aspects of both theoretical and applied science. This field is influential when it comes to informing the different policies of the government in safeguarding the environment all over the world. Environmental studies and environmental science have a lot of differences, the emphasis of which is on the human relationships with the current environment as well as the political and social dimensions pertaining to it.

Keywords – Environment, Engineering, biological etc.

Advancements in Sustainable Development: A Frontier in Science and Environment

Rohit Ajinath Kamble

Research Student- Anandrao Dhonde Alias Babaji Mahavidyalaya, Kada, Beed.

Email Id- kamblerohit4391@gmail.com

Abstract-

Sustainable development stands as a paramount goal in contemporary society, necessitating continual innovation and progress across various scientific and environmental domains. This abstract encapsulates the dynamic frontier of sustainable development, highlighting key areas of advancement and the interconnected nature of these endeavors. Renewable energy technologies continue to evolve, striving for enhanced efficiency and scalability to mitigate reliance on finite resources. Green chemistry principles permeate industries, aiming to minimize waste and environmental harm. The circular economy paradigm shifts toward resource efficiency and waste reduction, fostering resilience in the face of growing consumption demands. Climate adaptation strategies emerge as imperative, emphasizing resilience-building measures amidst escalating environmental challenges. Biodiversity conservation efforts intensify, acknowledging the intrinsic value of ecosystems and species diversity. Sustainable agriculture practices gain prominence, seeking to balance food security with environmental stewardship. Water management innovations address scarcity and pollution concerns, promoting equitable access and conservation. Urban sustainability initiatives prioritize livability, efficiency, and community well-being in rapidly urbanizing landscapes. Technological innovations, including AI and Io T, catalyze sustainability efforts across diverse sectors. Policy and governance frameworks play a pivotal role in shaping sustainable outcomes, necessitating collaborative, multi-level approaches. This abstract encapsulates the multifaceted frontier of sustainable development, underscored by interdisciplinary collaboration, innovation, and a holistic understanding of the interconnectedness between ecological, social, and economic systems.

Keywords- Sustainable development, Interdisciplinary collaboration

Development of Smart Water Quality Monitoring System

S.A.Tingare[1], S. K. Tilekar[1]

1Post Graduate Department of Electronics Shankarrao Mohite Mahavidyalaya, Akluj, Dist. Solapur -413 101 (Maharashtra), India
Email: shailajatingare@gmail.com

Abstract:

Designing a sophisticated electronic system for water parameter monitoring is an emerging field for research. The value of the physical parameters, the temperature, the pH, the conductivity and the concentration of dissolved oxygen are the measures to decide the quality of water. Thus, precisely monitoring of physical parameters such as temperature, EC, pH and DO of water is highly essential. These parameters reveal their variability with the temperature. Water quality management is essential for various applications such as textile, automobile, food, chemical industries, sugar factories, water treatment plants etc. The quality of water not only affects the industry but also living organs. The quality of water determines the ultimate success or failure of aquaculture. Water quality parameters affect respiration, feeding, metabolism and reproduction of aquatic life. To ensure aquatic life, water quality needs to be monitored in real-time. Therefore, in the present work represents a design and development of low-cost real-time monitoring aquarium water quality management system. The system consists of several sensors to measure physiochemical parameters. The parameters such as pH and temperature of the water. These measured values from the sensor are processed by design smart embedded system using advanced microcontroller ATmega 328P i.e. Arduino UNO. Processed values are displayed on LCD fitted on aquarium and SMS text message is send to owner through GSM Module. The results at various stages are interpreted in this paper.

Keywords: Water Quality, pH, conductivity, embedded system, ATmega 328P

E-Waste and Electronics: The Impact on the Environment

Rohokale Sima Lahu

Assistant Professor, Department of Electronic Sciences,

Corresponding author Email: simarohokale1998@gmail.com

Shri Dhokeshwar College, Takali Dhokeshwar.

Abstract:

Electronic devices have become one of the main contributors to solid waste worldwide, creating severe problems for our environment at every stage of their lifecycle. In this paper, we will discuss the environmental impact of electronics and e-waste to highlight the importance of properly disposing of and recycling old, purposeless, or malfunctioning devices. This is done by shredding, melting, or burning old electronic devices into tiny pieces that could be reused in a new electronic appliance. As a result, the exponential rise in manufactured and discarded devices is resulting in serious threats to our soil, water, air, and wildlife, which pose serious environmental risks to our environment. This has created a monumental e-waste problem across the world. The risk of chronic respiratory diseases has increased exponentially since the internet revolution.

Keywords*:* Social Media, Magazine, Facebook, Appearance -related Electronics and E-Waste,

IoT Based Smart Real Time Electronic system for Food Grain Storage in warehouse Application

S. N. Patil*, J. D. Deshpande and A. M. Pawar

Department of Electronics, Tuljaram Chaturchand College of Arts, Science & Commerce, Baramati. Dist. Pune 413102.

suhas.patil05@gmail.com, aparnapawar21@gmail.com

Abstract:

Modern instrumentation exhibits the deployment of ubiquitous and most pervasive technologies to enhance the reliability and preciseness in the results. To achieve these goals, instead of traditional sensor system, the use of intelligent sensor system is recommended. Therefore, the designers have to put rather more efforts in development of sophisticated instrumentation for divers applications. With continuous drastic change in environment it is very harmful to the yield growth, food grains preservation, fruits and food grain cultivation etc. We know that one of the most significant sources of income in a developing nation like India is agriculture. Good food storage is essential for ensuring food security, which is impacted by both food loss and wastage. Therefore, if losses can be decreased, there will be more food available. To maintain good storage facilities and stop food losses in this project, considering that things IoT based smart electronic nose for food grain storage is a valuable application of technology to ensure quality and safety of stored grain in remote locations with restricted access. This proposed system tracks and controls warehouse variables like grain level, temperature, humidity, CO, motion and smoke, all of which have a big impact on grains and their weight. If any of the sensors in this parameter falls below or above the threshold value, the control action will be initiated.

Keywords: Internet of Things (IoT), Real Time System, Food Grain Storage, Electronic Nose.

Review on: Perovskite recent progress and synthesis using Sol-Gel, characteristic, Applications.

Ejaz Nazir Shaikh, (Research Scholar)

Research Centre in Electronic Science and Department of Electronic Science, 1Loknete Vyankatrao Hiray Arts, Science and Commerce College Panchavati, Nashik, India.

E-mail: mynameisejaz@gmail.com

Abstract

Excessive use of conventional, non-renewable fossil fuels resources has been a major cause behind the degradation of the environment such as global warming, acid rains, increase in carbon dioxide content in the environment, smog, etc. Green energy resources such as solar, wind and tidal, and hydropower offer replacement to the fossil fuels so that the usage of conventional source of energy can be constricted. Metal halide perovskites are emerging field of photovoltaic technology. Within last decade, With the predicted parameters such as thickness (0.6 µm), defect density of absorber layer (1014 cm-3), band gap (1.50-1.6 eV) the encouraging result of maximum power conversion efficiency (PCE) 25.2%, the short-circuit current density (Jsc) is 25.67 mA/cm2 , and fill factor (FF) is 78.14% and open circuit voltage (Voc) is 1.0413V are predicted. Lead halide perovskites have emerged as one of the leading photovoltaic materials due to their long carrier lifetimes, high absorption coefficients, high tolerance to defects, and facile processing methods. Which makes them now already comparably efficient to silicon-based photovoltaic. High efficiency, flexibility, and cell architecture of the emerging hybrid halide perovskite have caught the attention of researchers and technologists in the field. This article provides a comprehensive review on characteristics of perovskite materials; pervoskite material preparation and synthesis method and recent progresses are reported. Sol-Gel is a low cost, well-established and flexible synthetic route to produce a wide range of micro- and nanostructures. Small variations in pH, temperature, precursors, time, pressure, atmosphere, among others, can lead to a wide family of compounds that share the same molecular structures. In this work, we present a general review of the synthesis of $LaMnO_3$/ $LaCrO_3$ based on Sol-Gel approach. The morphological, surface characteristics, optical studies and how to identify surface compositions of the various components of the prepared perovskites were also included in characterization of perovskite. The specific surface area of the perovskite, which is very important characteristic

of a solid catalyst, is strongly affected by the preparation method used. We conclude that, porous surface with internal pores contributing the highest surface areas mainly obtained by sol-gel better than other synthesis methods.i.e. Sol-Gel is simple, cheap and better method to synthesize perovskite material. Sol-Gel processes in the future could be assisted with photocatalyst during synthesis. This could induce the formation of desirable doping processes or could reduce the formation of secondary phases. The use of biomaterials in the synthesis of Sol-Gel, especially organic waste, offers a novel low-cost and ecological platform for the manufacture of functional materials.

Keywords— *Perovskite material, characteristics, applications, synthesis method, Perovskite, Sol-Gel, nanoparticles, specific surface area.*

Frontiers of Sustainable Development in Science and Environment

Amolik Rahul Maykal
Assistant Professor , Department Of English
Corresponding Author Email : rahulamoliksir@gmail.com
Shri. Dhokeshwar College , Takali Dhokeshwar .

Abstract

In the pursuit of sustainable development, the imperative of cross-sectoral collaboration emerges as a linchpin for addressing multifaceted challenges. This research investigates the dynamics and impact of collaboration across diverse sectors, including science, industry, government, and civil society, within the context of sustainable development in science and the environment. Through case studies and analyses, the study explores successful models of cross-sectoral collaboration, elucidating the key factors that contribute to their effectiveness. The research emphasizes the synergies that arise when sectors work in tandem to address complex issues such as climate change, biodiversity loss, and environmental degradation. Additionally, it examines challenges and barriers to collaboration, proposing strategies to overcome them. The study underscores the critical role of effective communication, shared goals, and mutual understanding in fostering collaborative endeavors. Insights derived from this research contribute to the advancement of theoretical frameworks and practical approaches for promoting cross-sectoral collaboration, providing a roadmap for stakeholders to navigate collaborative initiatives in the pursuit of sustainable development goals.

Ultimately, the findings advocate for a paradigm shift towards integrated, cooperative efforts as a cornerstone for achieving meaningful progress in the realm of science and environmental sustainability. Cross-Sectoral Collaboration (CSC) stands as a pivotal paradigm in contemporary sustainability discourse, offering a multifaceted approach to address complex societal and environmental challenges. This study delves into the intricate dynamics and transformative potential inherent in fostering collaboration across diverse sectors. Through an interdisciplinary lens, the research navigates the nuances of CSC, elucidating its fundamental principles, mechanisms, and outcomes.

Drawing upon theoretical frameworks and empirical evidence, the study examines successful case studies and best practices that exemplify effective collaboration among disparate sectors, including academia, government, industry, and civil society. Key themes explored include the role of leadership and governance structures in facilitating CSC initiatives, the importance of trust-building and shared values, and the cultivation of inclusive

decision-making processes. Furthermore, the research explores the synergies between CSC and sustainable development goals, highlighting its capacity to drive innovation, enhance resilience, and promote social equity.

Ethical considerations, power dynamics, and barriers to collaboration are also critically examined, offering insights into overcoming challenges and fostering meaningful partnerships. The findings underscore the imperative of adopting a collaborative ethos in addressing pressing global issues, advocating for collective action, and harnessing the collective intelligence of diverse stakeholders to co-create sustainable solutions. Through its comprehensive analysis, this study contributes to advancing theoretical understanding, informing policy formulation, and inspiring transformative action in the pursuit of a more resilient, equitable, and sustainable future.

Key words : **Interdisciplinary Research , Innovation and Technology,_Biodiversity Conservation,_Climate Change Mitigation and Adaptation**

Urban Planning and Sustainability: Navigating Environmental Challenges

Mr. Pratik Prakash Mane

(Asst.Prof. Dept. Of English, Shri Dhokeshwar College, Takali Dhokeshwar)

Abstract:

Urban planning plays an important role in solving complex urban challenges and environmental problems. As cities become centers of human activity and innovation, they face environmental concerns. In the face of climate change, resource limitations and environmental degradation, urban planning emerges as an important force in the pursuit of environmental sustainability.

In this landscape, factors such as resilience, sustainable construction and waste management are deeply intertwined in urban planning. These factors form the foundation for urban development that is designed not only to meet environmental challenges but also to thrive. They represent the driving forces behind our vision of transformable, sustainable and resilient cities.

Beyond these core elements, urban planning includes many other elements such as transport infrastructure, green space and community participation. These factors work together to shape cities that are better prepared for future environmental uncertainties. As we explore the complex interplay of these factors in urban planning, we aim to illuminate the path to ecologically sustainable cities that prioritize adaptability, harmony and vitality within cities.

Keywords: landscape, sustainable construction, waste management.

Rural Sustainable Environmental Management

Mr.Santosh B.Kokate
Asst. Prof. Department of Geography,
Shri Dhokeshwar College, Takali Dhokeshwar,
Tal-Parner Dist-Ahmednagar

Abstract

Rural environmental protection has received increasing attention in recent years. The economic development and population growth of rural areas results in many problems, such as environmental pollution, land degradation, resource depletion, biodiversity loss, income loss, and public health risks. Although much progress has been made, many major challenges to rural environmental management remain to be addressed. The question of how to deal with these problems through sustainable approaches has become an urgent issue in rural areas. This Special Issue, "*Rural Sustainable Environmental Management*", was dedicated to the perception of rural, sustainable environmental management based on the integration of economic, environmental, and social considerations. The Special Issue covered the topics about the rural land management and planning, sustainable rural water resources management, integrated simulation and optimization, rural environmental risk assessment and vulnerability analysis, rural water and wastewater treatment, rural environmental policy analysis, rural ecosystem protection and biodiversity recovery, and the characterization of emerging rural environmental problems and related solutions. These accepted papers focused on various perspectives of rural sustainable environmental management.

Keywords*:* rural areas; environmental management; sustainability

Global Environmental Issues and Human Wellbeing

Dr.Vijay N. Suroshi

Department Of Geography,

Shri Dhokeshwar College, Takali Dhokeshwar, Tal-Parner Dist Ahmednagar

Abstract:

Environment is the foundation and support of human existence and survival and the guarantee of sustainable human development; environmental protection has undoubtedly become a common understanding and development strategy of all countries of the world. Now humankind is striving into the historical process of postindustrial society and is trying to reach rebalance with environment in later stage of development. All countries need to perform respective duties and obligations in environment governance, in joint efforts to plan economic development, social progresses and environment protection to realize mutual wins and sustainable development of the world and to create an Earth homeland for harmonious co-existence of humankind and environment.

Keywords: ecological environment, ozone depletion, land desertification cultural services

Sustainable Development For Wind Enrgy In Ahmednagar District

S. FAKIR and AGALE N. K
Dept. of Geography, Shri Dnyaneshwar Mahavidyalaya Newasa

ABSTRCT:

Capacity of work is known as energy. It is prime need of human being. Man has change this energy resource form his pri history of civilization. In his primitive period he was using wood, coal, petroleum, natural gases, hydral energy, thermal energy and electricity. In modern period there is new innovation in renewable energy as the solar, wind, hydral, geothermal energy. This renewable has more capacity than the non-convectional energy resources, Horizontal movement of the air is known as wind. It is kinetic energy, this kinetic energy can be convert into the dynamic or electric energy, India is tropical monsoon country, It has good sources of wind velocity due to the physical and climatic condition .India is one of pioneer country of wind energy of world, Maharashtra state is generating wind enrgy last 40 years, Ahmednagar district generating electricity with the five wind farm as - Supa, Khandke, Dula wadgaon, Kuslum, and Khirvire. Total energy generation is 550 Megawatt.

Surrounding condition of the human being is known as environment, Due to the thermal power poject made more air pollution, In this air pollution, carbon material and solid material. Due to the wind energy it will be help prevent privint for air pollution, That's why wind energy is known as clean energy. In Ahmednagr district, this wind enrgy is applicable for the rural development, regional planning, It is useful for industrial, domestic and number of the activity. These wind farms are generating the electricity in the remote area,

Due to the physiographic condition and climatic condition. It has also potential site for generation of electricity. These site are directed by the NIWE Chennai, If that potential site generate the wind electricity it will be made agriculture development. Forest development, soil conservation and watershed programme in the hilly region. Generation of wind energy has not any limitation, anu one can be generate the wind electricity for his one need. That's why there is equlity and justice for the energy sector. Government of Maharashtra has established the Maharashtra Energy Development Agency, This organization in direction form the pune. This institution is made the research in renewable energy resources as well as controlling and planning for energy resources for the energy conservation.

Mixed Farming - An Overview

[1]Khemnar M.T, [2] Karale M.L and [3]Rashinkar S.V

[1]Department of Geography, Ramesh Phirodia Art's, Commerce & Science College, Sakur
[2]Department of Geography, New Art's, Commerce & Science College, A. Nagar (Autonomous)
[3] Ramesh Phirodia Art's, Commerce & Science College, Sakur

Abstract -

Mixed farming is a type of agricultural practice in which farmers cultivate multiple crops and raise different types of livestock on the same piece of land. This paper provides an overview of mixed farming, its benefits, challenges, and future prospects. The paper discusses the historical and global context of mixed farming the need of mixed farming and how it has evolved over time. Additionally, the paper examines the economic, social, and environmental benefits of mixed farming, including increased crop yields, improved soil health, and better income generation opportunities for farmers. The paper also examines the various methods of mixed farming practices. Finally, the paper concludes with a discussion of the future prospects of mixed farming, highlighting the importance of research, innovation, and policy support to promote sustainable and resilient mixed farming systems.

Key Words : Mixed Farming, Benefits, Methods of Mixed Farming

Historical Environmental Policy of Chhatrapati Shivaji Maharaj

Gavit P. M.
Assistant Professor, Department of History Shri Dhokeshwar College Takli Dhokeshwar, Tel. Parner, Distt. Ahmednagar
E.mail: pkshgavit8@gmail.com

Abstract:

Chhatrapati Shivaji Maharaj's “Swarajya (self-state)” is world famous for the welfare of the peoples. But we can see a rare king who created the ideal of maintaining the welfare of the people and the balance of the environment by making better use of the natural environment. Ramchandra Pant writes about Shiv Raya's policy in his "Adnyapatr" book, "Teak trees in our state should be cut with government permission as needed. Mango, Jackfruits and other fruit trees should not be cut even if they are needed for shipbuilding because these trees are not ready in one or two years. The people have raised them like own child. Trees, flower trees, vines, necessary and unnecessary trees should be planted on the fort so that they can be used at appropriate places on the fort”.

Maharaja developed “Ganimi Kava (Guerrilla war)” using geographical and environmental knowledge to expand the kingdom. The dense forests of the Sahyadri mountain range formed the self-defence shield of the ‘Swarajya’. It is believed that he may have coined the currency “Shivarai” from the word ‘Vanrai (forest)’ while creating the monetary system.

Overall, in the Medieval period of India, Chhatrapati Shivaji Maharaj created a “peoples state” with the help of geographical and environmental factors. If future rulers follow his example, every human factor will come forward to solve environmental problems, not limited to office documents.

Mixed Farming - An Overview

[1]Khemnar M.T, [2] Karale M.L and [3]Rashinkar S.V

[1]Department of Geography, Ramesh Phirodia Art's, Commerce & Science College, Sakur
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Abstract

Mixed farming is a type of agricultural practice in which farmers cultivate multiple crops and raise different types of livestock on the same piece of land. This paper provides an overview of mixed farming, its benefits, challenges, and future prospects. The paper discusses the historical and global context of mixed farming the need of mixed farming and how it has evolved over time. Additionally, the paper examines the economic, social, and environmental benefits of mixed farming, including increased crop yields, improved soil health, and better income generation opportunities for farmers. The paper also examines the various methods of mixed farming practices. Finally, the paper concludes with a discussion of the future prospects of mixed farming, highlighting the importance of research, innovation, and policy support to promote sustainable and resilient mixed farming systems.

Key Words : Mixed Farming, Benefits, Methods of Mixed Farming

Introduction:

Mixed farming, also known as mixed crop-livestock farming, is a traditional agricultural practice that has been used for centuries by farmers around the world. It involves growing multiple crops and raising different types of livestock on the same piece of land. This practice has evolved over time, and today it is used in many different regions and contexts, including in developed and developing countries, and in both small-scale and large-scale farming operations. The purpose of this paper is to provide an overview of mixed farming, its benefits, challenges, and future prospects.

Historical and Global Context:

Mixed farming has a long history, and it has been practiced in many different parts of the world. In Europe, for example, mixed farming was a common practice during the medieval period, where farmers grew crops such as wheat, barley, and oats, and raised livestock such as cattle, sheep, and pigs. In Africa, mixed farming has been a traditional practice for many centuries, where farmers cultivate crops such as maize, sorghum, and millet, and raise livestock such as cattle, goats, and chickens.

Today, mixed farming is practiced in many different regions and contexts, including in developed and developing countries, and in both small-scale and large-scale farming operations. In developed countries, mixed farming is often practiced on smaller farms, where farmers use crop rotation and animal manure to improve soil health and increase crop yields. In developing countries, mixed farming is often practiced on larger farms, where farmers use a combination of crops and livestock to generate income and improve food security.

Need for mixed farming

Most of the farmers are performing only one activity (crop cultivation) so their earning becomes totally dependent on value of crop. In addition, imperfect market situation, mismanagement of demand and supply of crop also affect adversely the income from crops. Enhancing the potential of the farmers for sustainable agriculture with higher returns is a vital process for food security in developing nations. Mixed farming system is one way of handling such problems because it provides better income returns to farm owners as well as higher productivity. As farmers involved in mono-culture are under more threat as compared to those performing many farming activities under certain market and environmental conditions. Mono-culture activity could be the only cultivation of crops with livestock. Farm integration has brought agriculture income to novel heights. Mixed farming can be defined as the combination of two or more independent agricultural activities on the same farm. It's to be an agricultural system in which farmers perform different agricultural practices together, such as cash crops and livestock so as to enhance income through different sources and to adjunct land and labor demands across the year. The mixed farming could be in the form of the crop-livestock, crop-forestry, crop-horticulture fish-pig, fish-duck, and paddy-fish etc.

Benefits of Mixed Farming:

There are many benefits of mixed farming, including economic, social, and environmental benefits. One of the primary economic benefits of mixed farming is that it allows farmers to diversify their income streams. By growing multiple crops and raising different types of livestock, farmers can spread their risk and reduce their reliance on any single crop or livestock species. Additionally, mixed farming can help farmers increase their crop yields by improving soil health and fertility through the use of animal manure.

Another benefit of mixed farming is that it can improve food security. By growing a variety of crops and raising different types of livestock, farmers can produce a more diverse range of foods, which can help to improve the nutritional quality of their diets. Additionally, mixed farming can help to reduce food waste, as any excess crops or livestock can be used as animal feed or sold in local markets.

Mixed farming also has important social benefits. It can help to promote rural development by generating income and employment opportunities for farmers and their families. Additionally, mixed farming can help to preserve traditional farming practices and local biodiversity by promoting the use of local crop varieties and animal breeds.

Methods of Mixed Farming

Mixed farming methods can be classified in several ways

1) Co-cultivation farming

Cultivating another crop with one crop in which one crop does not have any adverse effect on the other crop, rather if beneficial to each other's, such a method is called co-cultivation farming. For example, growing wheat and gram on the same land at the same time is co-cultivation. These practices minimize the risk of failure of one crop and insure against crop collapse due to adverse weather conditions. The crops to be grown jointly should have a different maturation of time and also different water requirements. One tall and one dwarf crop should be grown jointly. The nutrients required by one crop should be not as much of as those required by the other crops. One crop should have deep roots, others should be shallow. All these criteria lead to a successful co-cultivation pattern. Some combinations of crops are used by farmers: (1) Maize + potato (2) Cotton + Moong bean (3) Groundnut + Sunflower (4) Sorghum + Pigeon pea (5) Wheat + Chick pea (6) Barley + Chick pea

2) Agricultural crops with garden system

It is a system in which any agricultural crops are grown in the fertile wasteland lying in the fruit crops / garden. Growing spices in a coconut garden is good example of this system

3) Agricultural with forestry system

Forestry plants as well as agricultural crops are grown together in this system. In many places trees are grown around bunds of a field crop are taken in the field.

4) Beekeeping with agricultural crops

in this system farmers can cultivate agricultural crops along with bee keeping, so that there is no shortage of flowers for bees. Beekeeping with agriculture crops gives to the farmer additional income per box with compare to the single crop system. Sunflower, mustard and some other crops are suitable for bee keeping.

5) Fish with pig farming

In this system farmers can do fish rearing with pig farming. In general, 30-40 pigs provide so much manure so that fish can be raised in one hectare of pond (Sharma et al. 1985).

6) Farm pond system

In this system the rain water gets stored in the ground or takes the form of a drain or gets washed away and to store rain water, a small pond can be constructed and fish farming can

be done in it. Vegetables can also be produced from moisture waters. In this way, farmers get more income from the pond with vegetables framings compare to single farming system.

7) Fish with duck farming

In this, 250-300 hundred of ducks are enough to manure a 1 ha of water spread area. The fish with duck farming system provides meat, eggs in addition to fish. It generates production of extra food and benefits to the farmer compare to single system. Approximately 40-50 kg of organic wastes is converted into one kg of fish (Biswas 2015).

8) Fish with paddy farming

In this system, farmers can cultivate paddy as well as fish farming. By this method the yield of paddy is more than 50% income to the farmers in addition to their normal paddy crops (Saikia et al. 2008).

Conclusion-

Mixed farming has a very significant role to play in the sustainability of farming in future. The ability to include a grazing land or green manure into the system is paramount in building the soil and profitability of farm. Adding up livestock is basically means there is a return on the money invested instantly. As farmers struggle to achieve the correct sense of balance in these systems they will rely more and more on external suggestion. This will not only take the form of agronomic suggestion, but also include learning from another groups of farmer, and experts of different disciplines

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"Renewable Energy Technologies: Innovations and Applications"

Shinde Sagar Pandit
Research Student, Dr. Babasaheb Ambedkar Marathwada University, Sambhaji Nagar

Email: *sagarpanditshinde@gmail.com*

Abstract

Renewable energy technologies have gained significant attention as viable solutions to address the growing energy demand while mitigating climate change and reducing dependence on fossil fuels. This research paper delves into the innovations and applications of renewable energy technologies, exploring their potential to revolutionize the global energy landscape. This research paper discusses various renewable energy sources such as solar, wind, hydroelectric, biomass, and geothermal energy, highlighting recent advancements in technology and their diverse applications across different sectors. It also examines challenges hindering the widespread adoption of renewable energy technologies and proposes strategies to overcome these barriers. By synthesizing current research and case studies, this paper aims to provide valuable insights into the role of renewable energy technologies in achieving sustainable development goals and transitioning towards a low-carbon future. Sustainable energy conversion and management processes increasingly require an integrated approach, especially in the context of addressing the climate crisis.

Keywords: Renewable Energy, Innovation energy, green energy, solar energy, global energy

Irrigation Energy Technology: Development and its Positive Impact on Environment."

Vinod Madhukar Tupe
Research Student, Dr. Babasaheb Ambedkar Marathwada University, Sambhaji Nagar

Email: vinod.tupe9595@gmail.com

Abstract

Irrigation energy technologies include innovative methods of managing water resources for agriculture that reduce energy consumption and environmental impact. This progress aims to meet the twin challenge of meeting the growing demand for agricultural products while conserving natural resources and combating climate change. Here is an overview of the key aspects and positive environmental impacts of this technology The positive environmental impact of advanced irrigation energy technology is significant, providing a path towards more sustainable and resilient agricultural systems. By integrating these technologies, the agricultural sector can significantly contribute to global environmental goals, including water conservation, energy efficiency and reduction of greenhouse gas emissions, and this is the need of the Present Path.

Keywords:- Irrigation Energy, Development, Positive Impact, Environment.

Embracing Sustainability: Navigating the Intersections of Climate Change Mitigation and Resilience

Mr Deepak Bansode
(M.S.W. Ahmednagar)

Abstract

Sustainability and climate change represent intertwined global challenges that demand urgent attention and innovative solutions. This abstract examines the multifaceted dimensions of sustainability and its nexus with climate change, highlighting the imperative for comprehensive strategies to mitigate environmental degradation while fostering resilience in the face of escalating climate risks.

At its core, sustainability embodies the harmonious coexistence of environmental, social, and economic systems, striving to meet the needs of the present without compromising the ability of future generations to meet their own needs. Climate change, fueled predominantly by anthropogenic activities, poses unprecedented threats to ecosystems, communities, and economies worldwide, exacerbating environmental degradation, exacerbating social inequalities, and amplifying economic vulnerabilities.

In confronting these challenges, an integrated approach to sustainability is paramount, emphasizing synergies among mitigation, adaptation, and resilience-building efforts. Mitigation strategies target the reduction of greenhouse gas emissions, encompassing shifts toward renewable energy, enhanced energy efficiency, sustainable land use practices, and the preservation of biodiversity. Concurrently, adaptation measures seek to bolster societal and ecological resilience to the impacts of climate change, spanning infrastructural enhancements, disaster preparedness, community engagement, and ecosystem-based approaches.

Moreover, addressing sustainability and climate change necessitates a paradigm shift in governance, finance, and technology, entailing collaborative partnerships across sectors, scales, and stakeholders. Embracing innovation and knowledge-sharing platforms can catalyse transformative change, fostering the emergence of sustainable lifestyles, industries, and policy frameworks.

Nevertheless, the pursuit of sustainability is fraught with complexities and trade-offs, engendering competing interests, trade-offs, and ethical dilemmas. Striking a balance between short-term imperatives and long-term sustainability aspirations necessitates

visionary leadership, robust governance structures, and inclusive decision-making processes that prioritize equity, justice, and intergenerational equity.

In conclusion, sustainability serves as both a guiding principle and a moral imperative in navigating the converging challenges of climate change and environmental degradation. By embracing a holistic vision of sustainability, grounded in principles of equity, resilience, and stewardship, humanity can forge a path toward a more equitable, prosperous, and sustainable future for all.

Key Words: Global challenges, anthropogenic activities, Climate change , disaster preparedness, community engagement, and ecosystem-based approaches.

Synthesis of Nickel Sulphide(NiS) ,Cadmium Sulphide(CdS) Supercapacitor Electrodes by Simple Chemical Methods

Nitin D. Wable[a] , Tanaji P Gujar[b], Pradip B Shelke[*]

[a] *Research Scholar, Dept. of Physics Ahmednagar College, Ahmednagar , (MS), India – 414001.*

[b] Research guide & Assosiate Professor, *Department of Physics, ADT's Shardabai Pawar Mahila Arts, Commerce & Science College, Shardanagar, Baramati, (MS), India, 413115.*

*,*Represents Corresponding Author:* Research guide & assosiate Professor *Department of Physics Ahmednagar College, Ahmednagar , (MS), India* – 414001

Abstract:

In recent years, the global population has been growing rapidly, leading to an increased demand for non-renewable energy sources such as fuel, gas, and nuclear power.it results the utilization of non-renewable energy sources has in numerous challenges worldwide. One of the primary issues is that these energy sources are limited in quantity and availability. As an alternative, renewable energy sources such as solar energy, biomass, wind energy, and other forms of green energy have gained importance . However, some renewable energy sources like solar and wind energy are intermittent and not consistently available throughout the day. Therefore, there is a need to develop energy storage devices that can store the generated energy for various applications.

Energy storage devices commonly used in the field include electrochemical capacitors (SCs), batteries, fuel cells, and conventional capacitors .Batteries and fuel cells are preferred for energy storage due to their high energy density. While these storage options can store significant amounts of energy, they typically require more time to charge. Moreover, in battery storage systems, there can be a mismatch between power supply and demand, resulting in temporal and spatial gaps between energy availability and consumption. This emphasizes the critical need for the development of efficient and long-lasting energy storage technologies to address these challenges.

Conversely, In recent years, Supercapacitors (SCs) are getting much attention among various electrochemical energy storage systems due to several features like a longer life span, high power with a considerable amount of energy, and an easy fabrication process with low maintenance, unlike batteries. Still, energy density values of SCs could not match the existing requirements of electrical appliances or portable devices, which are prime needs for improved

lifestyle and economic development. To reach the high values of energy and power density, numerous materials are studied as cathodes for hybrid SC applications like metal oxides, hydroxides, and sulfides. But their application in a SC is restricted due to poor stability, poor conductivity, and less energy density owing to low specific capacitance. The electrode material with higher specific capacitance, good cycling ability, and cost-effective synthesis are pre-requisites of the SCs for industrial application.

Herein, we report the synthesis of Nickel Sulphide (NiS),Cadmium Sulphide SCs Electrode by simple SILAR ,CBD and MCBD Method for electrochemical supercapacitive electrode on Glass & stainless steel substrate. The as-prepared electrode materials are characterized by FE-SEM, XRD, FTIR, RAMAN, HR-TEM and XPS. Specific capacitance and cyclic stability shows better performance than reported values. For development of next generation supercapacitor, NiS electrode opens up new aspects of opportunities for designing of electrode materials architecture.

Nanotechnology for Sustainable Development of Environment

A. K. Paimode[1], S. L. Kadam[2]

1. Research Student, Dept. of Physics, Ahmednagar College, Ahmednagar.
2. Dept. of Physics, New Arts, Commerce, and Science College, Parner.

Abstract

Due to the increase in the human population, there are many more environmental issues that the world has been facing in the past few decades. Climate change is one of the major environmental threats. In the last few years, the surface temperature of the earth has been increasing and in the next few decades, this increase in temperature will create many critical situations for human life. The nanotechnology research agenda focused on the various sustainable approaches to solve many environmental issues. Nanotechnology will improve global sustainability in energy as well as the basic needs of the living world. The focus of nanotechnology-based solutions for human society's challenges in clean water and energy supplies is greenhouse gas management.

Nanotechnological applications are being explored to provide solutions to clean up air and water as well as to improve the performance of conventional technologies used in environmental clean-up. This branch of nanotechnology that investigates sustainability through various applications is called as Green Nanotechnology. Currently, nanotechnology promises to solve various environmental issues using green synthesis of various Nanocomposite materials. We know that renewable energies like solar and hydrogen fuel cells cause almost zero emissions. Renewable energy applications primarily involve nanotechnology and its composite materials. Hence the biggest global issues like climate change and global warming can be reduced by increasing the efficiency and uses of renewable energy.

Overall it is essential to approach nanotechnological development through various applications with caution and commitment to make a positive impact on the sustainable development of environment.

Keywords- Nanotechnology, Nanocomposites, Global Warming, Sustainable Environment, Renewable Energy.

Physics For Environment and Sustainable Development

Chemate Rohini Bansi

Assistant Professor, Department of Physics,

Shree Dhokeshwar College, Takali Dhokeshwar 414304

Tal- Parner, Dist. Ahmednagar, Maharashtra, India

Corresponding author E-mail: rohinichemate1996@gmail.com

Abstract:

Science uses knowledge to better understand environmental issues, such as air or water chemistry, climate modeling, or the ecological effects of pollution. **Technology** refers to the products and approaches that either create environmental problems or have the potential to solve them. We might think about cars with internal combustion engines as sources of air pollution and greenhouse gases. Or electric cars as a potential solution to these problems. But bikes and roads are also technologies, and we need to consider their design and use in thinking about environmental issues. Physics is essential for understanding natural phenomena. It provides a basis for understanding the impact of humans on the environment. This understanding is essential for environmental stewardship. Environmental physics is essentially the applications of the principles of physics to environmental processes and problems. Environmental physicists use the principles and techniques of physics to study the earth's environment. Physics and the Environment directly connect the physical world to environmental issues that the world is facing today and will face in the future. It shows how the first and second laws of thermodynamics limit the efficiencies of fossil-fuel energy conversions to less than 100%, while also discussing how clever technologies can enhance overall performance. It also extensively discusses renewable forms of energy, their physical constraints and how we must use science and engineering as tools to solve problems instead of opinion and politics.

Synthesis of Nickel Sulphide(NiS) ,Cadmium Sulphide(CdS) Supercapacitor Electrodes by Simple Chemical Methods

Nitin D. Wable[a] , Tanaji P Gujar[b], Pradip B Shelke[*]

[a] *Research Scholar, Dept. of Physics Ahmednagar College, Ahmednagar , (MS), India –* 414001.

[b] Research guide & Assosiate Professor, *Department of Physics, ADT's Shardabai Pawar Mahila Arts, Commerce & Science College, Shardanagar, Baramati, (MS), India, 413115.*

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Exploring the Inherent Tensions at the Nexus of Education for Sustainable Development and Neoliberalism

Mr. Virendra S. Dhanashetti

Associate Professor & Head of the Department Political Science
AJMVPS's SHR DHOKESHWAR COLLEGE,
Takali Dhokeshwar, Tal. Partner,
Dist. A' Nagar-414304

Abstract:

To overcome the anthropogenic and global issues facing humanity today, young people will require a level of democracy, citizenship and altruism that is lacking in our current education system and is often antagonistic to the dominant neoliberal values, structures and underlying assumptions of our increasingly globalized education systems. This article explores the inherent tension between education for sustainable development within a neoliberal political and economic system, through conducting post-structural policy analysis on SDG 4—Target 4.7. This process highlights a highly politicized education development agenda that problematizes both the current state of the world and global education systems as failing to equip young people with the knowledge and skill necessary to promote sustainable development. This leads to a range of discursive and lived effects including the increased reliance on transnational organizations, increasing performativity in schools and the subjectification of teachers and students.

Keywords Neoliberalism, education, sustainable development

Synthesis of Nickel Sulphide(NiS) ,Cadmium Sulphide(CdS) Supercapacitor Electrodes by Simple Chemical Methods

Nitin D. Wable[a] , Tanaji P Gujar[b], Pradip B Shelke[*]

[a] *Research Scholar, Dept. of Physics Ahmednagar College, Ahmednagar , (MS), India – 414001.*

[b] Research guide & Assosiate Professor, *Department of Physics, ADT's Shardabai Pawar Mahila Arts, Commerce & Science College, Shardanagar, Baramati, (MS), India, 413115.*

*,*Represents Corresponding Author:* Research guide & assosiate Professor *Department of Physics Ahmednagar College, Ahmednagar , (MS), India* – 414001

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Environment and Science Importance and Challenges

Lokhande D. M.

Shri.Dokeshwar College, Takali Dhikeshwar Tal.Parner, Dist-Ahmednagar

Abstract

Environment plays an important role in healthy living and the existence of life on planet earth. Earth is a home for different living species and we all are dependent on the environment for food, air, water, and other needs. Therefore, it is important for every individual to save and protect our environment. To figure out a more sustainable way of living. Understanding the behavior exhibited by organisms under some natural conditions. Educating and making people aware of different environmental issues and problems. Environment belongs to all living beings and thus is important for all. Each one is affected by environmental issues like global warming, depletion of ozone layer, dwindling forest, energy resources, loss of global biodiversity etc. Environment study deals with the analysis of the processes in water, air, land, soil and organisms which lead to pollute or degrade the environment. It helps us to establish a standard for a safe, clean and healthy natural ecosystem. It also deals with important issues like safe and clean drinking water, hygienic living conditions and clean and fresh air, fertility of land, healthy food and development. Sustainable environmental law, environmental protection, management and environmental engineering are emerging as dimensions in environment protection and management.

Key words – Education, Environment, Sustainable, Management

Diversity of Gall Midges (Diptera : Cecidomyiidae) From Rahata Tahsil of Ahmednagar District (MS)

Wagh S. R.

Department of Zoology, New Arts, Commerce and Science College, Parner Dist. Ahmednagar – 414 302

E mail: sudhirwagh19@gmaol.com srwagh@rediffmail.com Cell: 09403190432

ABSTRACT

The gall midges are economically very important group of insects from agriculture and forestry point of view. The name gall midge comes from the ability of the larvae to produce galls or abnormal growth on various organs of plants. Gall midges are small, fragile flies found attacking to variety of plants. They are reported as major pests infesting several crop and non crop plants. Adult gall midges live in various environments in forests, fields, meadows, near streams and on stands along the riverside. Ahmednagar District is mostly an agricultural region, which seems to be rich in Cecidomyiid fauna. Routine morphological and anatomical techniques will be followed to identify the species of gall midges. Fifteen species of gall midges from Ahmednagar district were collected, preserved and identified up till now.

Prevalence and Infection by Cestode Parasites, its Seasonal Variation and Impacts on productivity.

T. S. Barve 1 , S. S. Kekade2, S. N. Pokale1,

1 New Arts, Commerce, and Science College (Autonomous) Ahmednagar, Maharashtra India

2 Radhabai Kale Mahila Mahavidyalaya, Ahmednagar.

E-mail: truptibarve46@gmail.com

Abstract

Cestodes are helminths which are small worms measuring about 20- 25 mm long, having segmented body and completes their life cycles in one definitive host and more than one intermediate hosts. They live as a intestinal parasites and are responsible to cause dangerous diseases to hosts. Cestodes infects wide range of vertebrate hosts like goat, sheep, cats, dogs, fishes, birds, rats etc. Seasonal variation play very important role in prevalence and infection by cestode parasites. During the period ofrainy season and after the period of rainy season most of infections were found in vertebrate hosts. Collected cestode parasites were preserved in 4% formalin to study its morphometry and were also preserved in 96% for its molecular study. For molecular study PCR methodology were used for the sequencing of CO-I gene. Result of sequencing is very useful to understand the variation and similarities between the closely related species of cestode parasites. The infection by cestode parasites to the vertebrate hots like Hens, Pheasants, Goat, Sheep, and Fish can reduces its productivity of, nutritional value and Market value.

Key Words: Helminths, Prevalence, Morphometry, PCR Methodology, CO-I Gene.

The Elaborate structure of spider silk (web)some localities from Ahmednagar City

Khomane T.S[1] Saraf S.A

[1]Dr. Rafiq Zakaria College for Women, Jubilee Park, Aurangabad (M.S.) India. 'Department of Zoology, Babasaheb Ambedkar Marathwada University Aurangabad (M.S.) India.

Email ID:- tanujakhomane123@gmail.com

Abstract

India is rich in both flora and fauna and is mega diverse country. Spiders is one of the most diverse groups of animals . the study was conducted in Ahmednagar city from some localities like Mekari , Nimbodi , shapur , chandbibi mahal etc .spider are one of the most diverse and the uniquitous group .the spider silk is an astonishingly tough biomaterial that consists almost entirely of large protein . In this study an attempt is made to analyse the geometrical charactertistics of the web construction building unit such as spirals and radials .The research activity was spread over a period of six months from January 2023 to june 2023 . The study found the different types of web like funnel web , Orb web ,sheet web orb web is the dominant guilds of spiders

Key words: Ahmednagar, web , Spiders, group

Foraging behaviour of *Apis mellifera* on flowers of *Helianthus annus, Allium cepa, Brassica nigra,* at central region of Maharashtra: A Review

Zaware R.V*, Harkal A. D.
[1&2] Department of zoology and Research Centre, Ahmednagar Jilha Maratha Vidya Prasarak Samaj, New Arts, Commerce & Science College Ahmednagar 414001.(Autonomous).

Email –**rajashrizaware1@gmail.com**

Abstract

This review article focuses on *Apis mellifera* feeding behaviour on particular flowers. One of the characteristics that set honeybees apart is their foraging behaviour. This behaviour serves as a link between the environment and the honeybee colony. Foraging behaviour includes flower inspection rate, pollinator and stigma communication, track change probability, and tree change probability. Appropriately or inappropriately, honey bees probed the base of flowers in search of nectar. Every bee adheres to the same set of behavioural rules. Research on the neurobiology of memory suggests that different types of memory are located in different areas of the honeybee brain. *Apis mellifera* shown the mushroom bodies' associative memory and the antennal lobes' non-associative memory. For each honeybee colony, an appropriate daily pollen load production ranged from 8.5 to 12.7 g. Since pollen flow through the colonies was lowest during the monsoon, it was highest in the spring and lowest in the winter and summer. The flower and pollen availability determine which bee species chooses as its pollen host. Nectar production and honeybee foraging behaviour were found to be positively correlated. Foraging rate of Apis maxima: 10.68 flowers per minute. Honey yield in mustard (*Brassica nigra*) was positively correlated with the percentage of pollen gathering activity, with a maximum production amount of 4 kg per box. Upon collecting nectar from sunflowers (*Helianthus annus*), honeybees frequently become very covered with pollen. Pollen is forced out of the stigma and made accessible to foraging bees as it grows via the pollen anther tube. The average yields and pollination of onion (*Alliun cepa)* seeds, particularly hybrid seeds, are significantly influenced by bee pollinator activity. The number of honeybees that successfully pollinate an onion can have a significant impact on the output of onion seeds.

Keywords: *Allium cepa*, *Apis mellifera*, foraging habit

Seasonal Incidence of Insect Pests Associated with Mulberry plants of Parner Taluka Ahmednagar District (M.S.) India.

Popat P. Pathare

Department of Zoology, Shri Mulikadevi Mahavidyalaya, Nighoj, (M.S.) India

Corresponding Author- popatpathare9@gmail.com

Abstract:

The mulberry plant (Morus alba) is the important sole food for mulberry silkworm (*Bombyx mori* L.) which is used in the sericulture industry. Mulberry plant leaves play an exclusive role in silk production but many insect pests attack on mulberry plant and they have adverse effects on the mulberry plant which results in the deterioration of the quality and production of mulberry plant leaves. The current study is carried out to find the seasonal occurrence of insect pests, the nature of the damage, and the symptoms of insect pests associated with mulberry fields from various sites of Parner Taluka Ahamadnagar District Maharashtra state, India. The results of the present study show that the insect species diversity found from various sites of mulberry gardens which are belonging to different families such as Arctidae (03 Species), Pyralidae (01 Species), Papilionidae (01 Specie), Scarabaeidae (01 Specie) Scutelleridae (01 Specie), Tessaratomidae (01 Specie), and Thripidae (01 Specie). All the species are belonging to Phylum-Arthropoda, Class: Insecta. All the above species are found in the selected study area during the study period. The present study results show that the different insect pests damaged the Mulberry plant in the study area which causes heavy economic loss to sericulturists or farmers.

Keywords: Mulberry, Silkworm, Insect pests, Incidence, Bombyx mori L., Parner, Ahmednagar.

Sugar industries & physico-chemical characteristics of ground water nearby area.

Gangotri V.M.

Head of Dept. of Zoology Shri Dhokeshwar College,Takali Dhokeshwar Dist : Ahmednagar (M.S.)

Abstract

In Ahmednagar district of Maharashtra state ground water polluted by the sugar industrial effluent.Aquatic fauna like crabs,snails,fishes affected badly due to pollution.It is also harmful to human health if polluted water consumed by them.Physico-chemical analysis of different water samples showed change in colour & fowl smell.High level of total dissolved salts,ca & chlorides seen.Water is unsafe for drinking due to high amount of sulphates,nitrates,& sodium.Present study indicates groundwater within range of one kilometer nearby sugar-industries recieves industrial effluents by percolation.It causes groundwater pollution making most of water non-palatable.

Keywords : Groundwater quality,water pollution,sugar industry, effluent,Toxicity, aquatic fauna**.**

Phytoplankton Composition of Mandohol Dam in relation to Fish Culture, Ahmednagar District, Maharashtra

. Dalavi S. D [1] And Pawar B. A. *

Department of Zoology, P.V.P. College, PRAVARANAGAR, AHMEDNAGAR - 413 713 (M.S.), INDIA

Corresponding author E-mail : dalvi25592samir@gmail.com

ABSTRACT

The qualitative and quantitative studies on phytoplankton of Mandohol dam in Ahmednagar district, Maharashtra was made during September 2020 to August 2021.in order to assess suitability of this lake for fish culture. Phytoplankton species which occurred during the study period were categorized into Chlorophyceae, Cyanophyceae, Bacillariophyceae and Euglenophyceae with a total of 31 generic taxa (20 species of Chlorophyceae, 7 species of Cyanophyceae, 18 Bacillariophyceae and 1 species of Euglenophyceae). Chlorophyceae were found to be dominant and present in a reasonable number throughout the year. The annual mean population density of phytoplankton was observed to be 6.10 l^{-1}. The maximum density of phytoplankton was recorded during summer (7.61 l^{-1}), whereas minimum during rainy (5.17 l^{-1}). Abundance of phytoplankton support high population of natural food to zooplankton and fish.

Keywords:- Fish Culture Phytoplankton, Zooplankton

A review on diversity of Icthyofauna from Ghod Dam

[1]Thokal J. A. and Wagh S. R.*

Email: **jyotithokal8@gmail.com**

[1]Department of Zoology and Research Centre, J. M. V.P. Samaj's, New Arts, Commerce & Science College Ahmednagar 414001.

*Department of Zoology, J. M. V.P. Samaj's,, New Arts, Commerce & Science College Parner

Abstract

During investigation the Ichthyofauna of Ghod reservoir and its potential towards fish culture was studied. The assessment was based on the study of fish diversity. Altogether 25 fish species belonging to 19 different genera, 10 families and 6 orders were reported by researchers from this reservoir. (Lalita Kunjir and S. A. Kawade., 2021) The study revealed that Ghod reservoir possesses rich fish diversity that assisted the economy of local fishermen community and also supplemented protein rich food to the local people. In the present study good number of fish species availability and their production in Ghod reservoir may be related to suitable ecology of water body which provides proper breeding ground for fish. But appropriate conservation actions are required to maintain sustainability and richness of the species diversity of the reservoir.

Keywords: Conservation , fish culture , Ichthyofauna

Environmental and political policy-making

Dr. Jijabhau Sitaram Ghule
Asst. Prof. Department of political Science
Shri Dhokeshwar Collage
Takli Dhokeshwar, Tal. - Parner,
Dist.- Ahmednagar

Abstract

Environmental and political policy-making are closely linked and crucial for shaping the way societies address pressing environmental challenges. The interaction between the environment and politics is complex, as environmental issues often require a multidisciplinary approach and involve various stakeholders, including governments, businesses, non-governmental organizations, and the public. Effective policy-making in this area requires careful consideration of scientific evidence, economic implications, social impacts, and ethical considerations.

One of the key roles of political policy-making in the environmental sphere is to address global challenges such as climate change, deforestation, loss of biodiversity, pollution, and resource depletion. These issues are inherently interconnected with social and economic systems, and effective policy-making must consider the broader implications of environmental decisions.

Political policy-making in the environmental realm can take various forms, including international treaties, national laws and regulations, regional agreements, and local ordinances. For example, international climate change agreements such as the Paris Agreement aim to coordinate efforts among countries to mitigate greenhouse gas emissions and adapt to the impacts of climate change. Meanwhile, national policies may focus on regulating industrial pollution, promoting renewable energy, or protecting natural habitats. One of the challenges in environmental policy-making is the long-term nature of environmental issues and the often-short-term focus of political cycles.

Public opinion and advocacy also play a significant role in shaping environmental policy-making. Grassroots movements, environmental organizations, and public outcry can influence political agendas and drive policy changes. Public awareness and engagement are crucial for creating the momentum necessary to enact meaningful environmental policies. In recent years, the concept of sustainable development has gained traction as a guiding principle for environmental policy-making. Sustainable development seeks to balance

economic, social, and environmental objectives to ensure that present and future generations can meet their needs without compromising the health of the planet. Policymakers are increasingly recognizing the importance of integrating sustainability principles into policy-making processes. Environmental policy-making also intersects with other policy areas, such as energy, transportation, agriculture, and urban planning. For example, policies aimed at promoting clean energy sources or reducing reliance on fossil fuels have implications for both environmental and energy security.

Finally, environmental policy-making involves collaboration and negotiation at multiple levels, from local governments to international organizations. Diplomacy and cooperation are crucial for addressing global environmental challenges that transcend national borders. International collaboration is essential for solving issues such as transboundary pollution, biodiversity conservation, and the management of shared natural resources.

In conclusion, environmental policy-making is a multifaceted and complex process that requires careful consideration of scientific evidence, economic implications, social impacts, and ethical considerations. It involves balancing competing interests, integrating sustainability principles, considering long-term impacts, engaging the public, and collaborating at various levels. Effective environmental policy-making is essential for addressing global environmental challenges and ensuring a sustainable future for the planet and its inhabitants.

The Effect Study of Vehicular Pollutants on Roadside Plant

Bidve Prajkta Ramesh
Ramesh Phirodia Arts, Commerce & Science College, Sakur

Abstract –

Clean air can no longer be taken for granted. Today the air in most large Indian cities is severely polluted and this pollution has a tremendous impact on the health of the population. Industrialization, the growth in number of vehicles in urban areas and the burning of bio-fuels in rural households have lead to a rapid deterioration of indoor and outdoor air quality. Vehicles are significant source of air pollution on roadside plant.

Premature deaths due to respiratory and cardio-vascular diseases and illness due to chronic respiratory diseases like asthma and bronchitis have increased.

The document presents a review of the vehicular pollutants problems in Indian cities, the various development that have taken place in the including the studies conducted for assessment of the air quality in the cities.

Keywords *– Vehicular Pollution, Air Pollution, Deterioration of indoor & outdoor air quality.*

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Dubey, P.S., 1977. Herbicidal Pollution – Pollen damage due to herbicides. Environ Pollut. 13: 169 – 171.

Preliminary phytochemical screening and HPTLC analysis of leaf extract of *Crotalaria Pallida* from Vidarbha region, MS, India.

Dr.Priyanka Pandharmise [1*], Dr Sanghita Jadhav [2],
S.N. Arts, D. J. Malpani Commerce and B. N. Sarada Science College (Autonomous),Sangamner,Dist.Ahmednagar.
pandharmise.priyanka15@gmail.com

Abstract

Native shrub *Crotalaria pallid* from Vidarbha region of central India is explored as it has a part of ethanomedicinal system of tribal community. Present study is aiming to identification and quantification of active constituents in *C. pallid* .Preliminary phytochemical screening of all three types of aqueous (AqE), methanol (ME) and petroleum ether (PEE) extracts showed the presence of alkaloids, terpenes, tannins, saponnins, glycosides, phenolic compounds and flavonoids. The HPTLC analysis,chromatograph of methanolic leaf extract of *Crotalaria pallid* at 366 nm showed total 11peaks while at 540 nm revealed 06 peaks with the Rf values of the peaks ranging from 0.01 to 0.95 resp. It has concluded that in all three types of extracts contain not a single compound but a mixture of compounds and so it is proven that the pharmacological activity shown by them are due to the collective effect of all the compounds in combined.

Keywords: Ethanomedicinal plant; phytochemical; chromatograph; HPTLC

The Effect Study of Vehicular Pollutants on Roadside Plant

Walve Puja Sudam
Ramesh Phirodia Arts, Commerce & Science College, Sakur

Abstract

Clean air can no longer be taken for granted. Today the air in most large Indian cities is severely polluted and this pollution has a tremendous impact on the health of the population. Industrialization, the growth in a number of vehicles in urban areas and the burning of bio-fuels in rural households have lead to a rapid deterioration of indoor and outdoor air quality. Vehicles are significant source of air pollution on roadside plant.

Premature deaths due to respiratory and cardiovascular diseases and illness due to chronic respiratory diseases like asthma and bronchitis have increased.

The document presents a review of the vehicular pollutants problems in Indian cities, the various development that have taken place in the including the studies conducted for assessment of the air quality in the cities.

Keywords *– Vehicular Pollution, Air Pollution, Deterioration of indoor & outdoor air quality.*

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Antimicrobial activity of medicinally important plant *Artemisia pallens* Wall.

Mulay A.M[1]., Gahile, Y. R[1]. and Nikam T.D[2].

[1]Department of Botany, New Arts, Commerce and Science College, Ahmednagar (Autonomous)

[2]Deparetmernt of Botany, Savitribai Phule Pune University, Pune

Email: yogeshgahile@gmail.com

Abstract:

Artemisia pallens Wall commonly known as davana is a small, aromatic plant belongs to family Asteraceae. It is traditionally used in Indian folk medicine for the treatment of diabetes mellitus, immunomodulating and wound healing, anthelmintic, antipyretic, antibacterial, antifungal, tonic properties and also as stimulant. In present study antibacterial activity of four different extracts (methanolic, Ethanolic, petroleum ether and distilled water) of *Artemisia pallens* was evaluated against two gram-positive (*Bacillus subtilis* and *Bacillus cereus*) and two-gram negative (*Escherichia coli* and *Pseudomonas* sps.) bacteria by using standard norms of well diffusion method and streptomycin as standard control. 100µl of microorganisms spread uniformly on nutrient agar medium plate. 100µl extract of different concentration (1µg/ml to 6µg/l) of methanolic, ethanolic, petroleum ether and distilled water extract were added in wells made on nutrient agar medium and incubated at 37^0C temperature for 24 hours. Experiment was carried out in triplicates.

For *E. coli* ethanolic extract showed highest zone of inhibition(7mm) as compare to methanolic (5mm) and petroleum ether (5mm) extract of 6µg/l concentration. Highest zone of inhibition was observed for 5µg/l of petroleum ether extract (13mm) for *Bacillus subtilis*, 6µg/l ethanolic extract (11mm) for Bacillus cereus, and 6µg/l of ethanolic extract for *Pseudomonas* sps. While distilled water extract did not shown zone of inhibition against any bacterial strain. So, methanolic and petroleum ether extract up to 2µg/l will not affect gut bacteria (*E. coli*) which are helpful for healthy person. 3µg/l ethanolic extract shown best antimicrobial activity (7mm ZOI) against *Bacillus cereus* and *Pseudomonas* sps. as compare to 1µg/l streptomycin (5mm ZOI) as standard, which have pathogenic effect on human being.

Keywords: antimicrobial, Artemisia pallens, bacteria.

(ZOI= zone of inhibition, µg/l= microgram per liter, µl = microliter)

Exploration of Some Less Vegetables Edible Plants From The Part of Bhimashankar Ghats (M.S.) India

Pawar K. W. and Gawali S. P.

Post Graduate Department of Botany and Research Centre, RBNB Collage shrirampur, Dist. Ahmednagar (M.S.) India. Affiliated by Savitribai Phule Pune, University Pune.

Corresponding Author email: sanketgawali0672@gmail.com

Abstract:

An in-depth study has been conducted in the study area of Northern western Ghats Maharashtra to collect quantitative ethnobotanical data on traditional wild vegetables of local wild species among the locals. Interviews with 40 knowledgeable informants were conducted at their workplaces during the pre-monsoon of 2022 and the post-monsoon of 2023 to gather the information for this article. 35 species from 30 genera and 21 families were studied. The importance of the plant specimen was assessed using quantitative ethnobotanical indices like Use value (UV) and Fidelity level (FL), and inferential statistical tests were performed to compare and measure the informants.

Keywords: Ethnobotanical, Quantitative, wild vegetables, Fidelity, Nature.

Metal-organic frameworks for energy-related applications: A Micro review

Mr. Sunil Pandurang Gawali
Faculty of Chemistry, Sundarro More Art's, Commerce and Science College Poladpur, Raigad (M.S.) 414303, India.[1]
Contact No. – 9188888860861 E-mail id- spgawali1986@gmail.com

Abstract:

Metal-Organic frameworks (MOFs), also known as porous coordination polymers (PCPs), have attracted great interest because of their unique highly porous structures, synthetic advantages, organic-inorganic hybrid nature, and versatile applications. Recently, the applications of MOFs in energy fields such as fuel storage, photo-induced hydrogen evolution, fuel cells, batteries, and supercapacitors have experienced a new surge of interest in both the chemistry and materials science communities. Recently, the development of clean sustainable energy storage and conversion technologies to deal with environmental pollution and the forthcoming energy crisis has attracted much attention in the energy research community. It is critical to develop carriers to store energy or to facilitate mass and electron transportation in energy storage and conversion. Research on the various applications of MOFs has shown that they are promising porous materials for energy storage and conversion technologies because of their inherent advantages, including structural diversity, functionality, tailorability, and versatile applications. Current micro review describes the recent progress in the energy-related MOF applications. The most outstanding research papers and reviews, which report the application of Metal-Organic Frameworks for gas storage, adsorption heat transformation, solar cells, fuel cells, hydrogen evolution reaction and supercapacitors are highlighted.

Key words- Metal-Organic frameworks. gas storage, solar cells, fuel cells.

General Purpose of Catalysis in Green Chemistry

Dudhade Vaishnavi Raosaheb, Mundhe Ganesh Nana, T. S. Thopate*

New Arts, Commerce and Science College, Parner, Ahmednagar, Maharashtra – 414 302, INDIA.

Abstract

Catalysis is a key principle of green chemistry. Catalysts lower the activation energy needed for a reaction to occur, which means we can use lower temperatures and pressures. This not only saves energy but also reduces waste and makes the process more energy-efficient and environmentally friendly. So, catalysis plays a crucial role in making chemical reactions greener and more sustainable approach.

Transition metals catalysts such as nickel, palladium, and platinum are more frequently used in various reactions due to their ability to facilitate the chemical transformations efficiently. The biological catalysts, enzymes are derived from living organisms play a crucial role especially in the field of biocatalysis. Homogeneous Catalysts exist in the same phase as the reactants and are often used in liquid-phase reactions. The acids, bases and certain metal complexes serves as homogeneous catalyst. But heterogeneous Catalysts are worked in a different phase from the reactants and are commonly used in solid-phase reactions. The metal oxides, zeolites, and supported metal catalysts are the examples of this type of catalysts.

Key Words: Catalysis, Chemical reaction, Green chemistry.

The Impact of Science and Technology on Sustainable Future in Agriculture

Anant Trimbakrao Nikalje
Dr. Babasaheb Ambedkar Marathwada University Chatrapati Sambhaji Nagar
atnikalje@gmail.com

Abstract:

The intersection of science, technology, and agriculture has paved the way for innovative solutions to address the pressing challenges of sustainable food production. This paper explores the transformative impact of science and technology on shaping a sustainable future for agriculture. Through advancements in fields such as biotechnology, precision farming, and renewable energy, agriculture has witnessed significant improvements in productivity, resource efficiency, and environmental sustainability. Biotechnology has revolutionized crop breeding, enabling the development of genetically modified organisms (GMOs) with enhanced resistance to pests and diseases, tolerance to abiotic stresses, and increased nutritional value. Precision farming techniques, empowered by the Internet of Things (IoT), satellite imagery, and machine learning algorithms, optimize resource allocation by providing real-time data on soil health, weather patterns, and crop performance. Moreover, the integration of renewable energy sources, such as solar and wind power, into agricultural practices reduces dependence on fossil fuels and mitigates greenhouse gas emissions. These advancements not only bolster agricultural productivity but also promote sustainability by minimizing resource depletion, reducing environmental degradation, and mitigating the impacts of climate change. However, the adoption of these technologies is not without challenges, including technological barriers, regulatory constraints, and socio-economic disparities. Addressing these challenges requires collaborative efforts among policymakers, researchers, industry stakeholders, and farming communities to ensure equitable access to technology, promote responsible innovation, and safeguard environmental and socio-economic well-being.

Keyword: Sustainable Agriculture, Climate-smart Agriculture.

Development of a novel heterogeneous catalytic system for organic transformation

Rupesh Barku Khose
(Ph.D Student)
SIES Colleges Arts, commerce and science college sion, Mumbai.

Abstract:-

Due to its inherent advantages such as easy recovery and reuse of the catalysts/ reagents, and environmentally friendly nature, the heterogeneous system has gain popularity in the realm of organic synthesis. In recent years, several chemically or biologically potent molecules are achieved through heterogeneous synthesis strategies. By recalling some of the classical fundamentals of the heterogeneous system in important organic synthesis, this mini-review outlines the recent developments in the applications heterogeneous catalysts and reagents; particularly in the solid phase synthesis, esterification and transesterification reactions to produce biodiesel, and Henry reaction.

Keywords: Biodiesel, esterification, Henry reaction, organic transformation, transesterification, heterogeneous catalyst.

Study of the structural, magnetic and adsorption properties of Pr (Praseodymium) doped in cobalt ferrite nanoparticles

Nilesh A Pawar[1*], Ramesh B Kharade [2]

[1,2,] -Post Graduate Department of Physics, New Arts, Commerce and Science College, Parner, Maharashtara-414302, India.

*Corresponding Author Email: napawar9@gmail.com

Rare – earth (RE) Pr^{3+} (**Praseodymium)** Substituted Cobalt ferrite $CoFe_{1.9}Pr_{0.1}O_4$ nano particles are synthesised by Sol-gel auto combustion method. The effects of Pr substitution on structural, magnetic and adsorption properties of cobalt ferrite nanoparticles are investigated. Structure, morphology, particle size, chemical composition and magnetic properties of t nanoparticles are studied by X-ray diffraction (XRD), transmission electron microscopy (TEM), high solution transmission electron microscopy (HRTEM), energy-dispersive spectrometer (EDS), Fourier transform spectroscopy (FTIR), Raman spectra and vibrating sample magnetometry (VSM). The results indicate that the as-synthesized samples have the pure spinel phase, uniform crystallite size and narrow par distribution. Meanwhile, the Pr substitution leads to the decrease in the particle size, magnetization and coercivity of the $CoFe_2o_4$ ferrite. Notably, it demonstrates that the Pr doping can apparently enhance the adsorption capacity for Congo red (CR) onto ferrite nanoparticles

Keywords: Adsorption; Magnetic nanoparticle; Rare-earth substitution

Phyto-Pharmacology of *Caralluma adscendens* Roxb

Pushpa Ghogare[1] and Rangnath Aher[2]

1, Research Centre, Department of Botany, New Arts, Commerce and Science College, Parner, Dist- Ahmednagar, Maharashtra – 414 302, INDIA.
2. Department of Botany, Shri Dhokeshwar College Takali Dhokeshwar, Tal- Parner, Dist- Ahmednagar, Maharashtra – 414 304, INDIA.

ABTSRACT

In various regions of India, *Caralluma adscendens* var. fimbriata is a unique plant that is utilised in traditional medicine for its antibacterial, antioxidant, anticancer, and antidiabetic properties. For centuries, plants have been associated with numerous medicinal benefits. Plant-based products are used medicinally all throughout the world, leading to the creation of many different drugs. The emergence of bacteria' resistance to various plants is the primary cause of infection diseases and problems with clinical treatment. This entails knowledge of traditional medicine and the existence of naturally occurring bioactive substances. Plants has medicinal characteristics and can be used to cure infections and diseases due to the existence of phytochemicals and bioactive substances such as flavanoids, phenol, alkaloids, and tannin. As a member of the Ascalpidaceae family, *Caralluma adscendens* var. fimbriata is locally known as "Makadsheguli" in Maharashtra. This thick, succulent cactus is edible. A perennial herb, *Caralluma adscendens* grows freely in the arid hilly regions of Satara district, Maharashtra, as well as in other Indian villages. Part of India's medical system includes the species of *Caralluma adscendens*. Tannins, glycosides, triterpenes, alkaloids, and saponins are abundant in the species. Pregenane glycoside, flavone glycoside, saponin glycoside, sistasterol, and tomentaganin are the essential phytochemical components that give the species their uniqueness and diversity. In the current investigation, many *Caralluma adscendens* extracts were examined for a range of factors. We may conclude that a variety of phytochemicals, including alkaloids, glycosides, saponins, tannins, flavonoids, and steroids, are present in all plant extracts. Proteins and carbohydrates are present in good amounts in the plant sample. The methanolic and aqueous extracts have higher total phenol and flavonoid contents. Phenolic chemicals are present in both methanolic and aqueous extracts, according to RP-HPLC analysis. According to the DPPH assay's IC50 values, the free radical scavenging ability of methanolic extract is about equal to that of conventional ascorbic acid and BHT. Methanolic extract is also shown to reduce lipid peroxidation more than other extracts. Therefore, it may be inferred that the methanolic and aqueous extract's higher concentration of phenolic chemicals may be the cause of its higher level of free radical inhibition.

Key words: Phyto-Pharmacological activity; *Caralluma adscendens.*

Use of Solar Energy in Industrial Applications, Sustainable and Eco-Friendly Methods

Abhishek Rajendra Sangale
Savitribai Phule Pune University, Pune
abhisheksangale2121@gmail.com

This successful experiment to harness energy from the sun, not only for domestic but also for industrial use, represents the new aspiration for sustainable and eco-friendly practices. It has taken considerable time to be convinced that the sun alone possesses the capability to harmonize these divergent aspirations, meeting the escalating energy demand, averting environmental upheavals, minimizing the footprint on the planet, and reinstating natural equilibrium. Promising indications of its realization are emerging. Vehicles equipped with solar panels on their roofs and airplanes propelled by solar wings have already been developed, with their utilization expected to rise. Residential solar energy is no longer a novelty; the challenge lies in generating the substantial heat or energy required for industrial applications. Bill Gates, known for backing innovative ventures, invested in the company 'Heliogen,' which has now achieved significant success in solar power generation. Using artificial intelligence and precise geometric design of mirrors, scientists and engineers have achieved the remarkable feat of generating thermal energy as hot as one thousand degrees Celsius from solar rays. This breakthrough heralds a paradigm shift, enabling industries like steel and cement to harness solar energy on an unprecedented scale. Bill Gross, another driving force behind the project, envisions a future where solar energy surpasses fossil fuels in affordability, significantly reducing the carbon footprint on Earth.

Keywords: Solar Energy, Industrial Applications, Sustainable Energy, Eco-Friendly Methods

Use of Solar Energy In Industrial Applications, Sustainable And Eco-Friendly Methods

Abhishek Rajendra Sangale
Savitribai Phule Pune University, Pune

Email: *abhisheksangale2121@gmail.com*

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Effect of sintering temperature on electronic properties of nanocrystalline $La_{0.7}Sr_{0.3}MnO_3$

Shankar S. Kekade[1], D. M. Phase[2], S. I. Patil[1]

[1]Department of Physics, Savitribai Phule Pune University, Pune - 411 007 (India)

[2]UGC DAE Consortium for Scientific Research, Indore-452 001 (India)

*_Corresponding author_: Shankar S. Kekade,

E-mail: shankarkekade@gmail.com

Abstract:

The effect of sintering temperature on the magnetic and electronic properties of $La_{0.7}Sr_{0.3}MnO_3$ (LSMO) synthesized by citrate gel technique is introduced. Single phase crystalline nature of all the sintered samples of $La_{0.7}Sr_{0.3}MnO_3$ powder was confirmed by X-ray diffraction. Sintering temperature plays an important role in controlling the grain size and making the highly crystalline nature of LSMO. The morphology results shows as increment in the average grain size of LSMO because of the grain growth as the sintering temperature increases. The chemical composition of $La_{0.7}Sr_{0.3}MnO_3$ and oxidation states of the elements has been confirmed using X-ray photoelectron spectroscopy. The core level photoelectron spectra of Lanthanum, Strontium, Manganese and oxygen were studied in detail. The study of valence band spectra revealed the effect of grain size on degree of hybridization of Mn e_g and O *2p* orbitals. This effect of grain size is accountable for change in ferromagnetic to paramagnetic transition temperature (T_C), resistivity, magnetic properties, and density of states at Fermi level.

Keywords: Perovskite, Sintering Temperature, XPS, VBS

Degradation of Insecticide -Chlorpyrifos by Nitrogen Fixing Bacterium, *Rhizobium sp.*

Shaikh Aarzoo Dagu
Shri Takali Dhokeshwar College,Takali Dhokeshwar,Pin code:414304; Maharashtra, India

Corresponding author: aarzoo911@gmail.com

ABSTRACT:

Chlorpyrifos is an Organophosphorus insecticide that has been widely used by farmers in farm for the purpose of increasing crop yield, but it has several side effects on ecosystem. When different concentrations of **Chlorpyrifos** used against ***Rhizobium sp.*** isolated from root nodules of ***Trigonella foenumgraecum*** with respect to measure *Rhizobium sp.* colony growth on YEMA media.The consumption of chlorpyrifos was being carried out to check the tolerance limit of *Rhizobium* against the pesticide.*Rhizobium sp.*Had shown Degradation Of Chlorpyrifos within analysis of Spectrophotometry by Reagent Para Amino Benzoic Acid.

Keywords: Rhizobium, Chlorpyrifos, Insecticide, Biodegradation, PABA

Challenges of the twenty-first century

Namdev M. Walhekar
Department of Chemistry, Shri Dhokeshwar College, Takali Dhokeshwar (M.S.) India

Corresponding Author- nmwalhekar@gmail.com

Abstract:

The twenty-first century has brought many new challenges in front of people today. What do we find if we look back at the twentieth century that has just passed? Clever man has made spectacular progress. Twenty-first century man has made great intellectual progress over his ancestors. The most serious challenge of the 21st century is the population explosion. India's population has crossed the billion mark. Poverty and unemployment is a big challenge before our India. Green Revolution, White Revolution has provided fodder to everyone. In the twenty-first century, the big question facing people today is the environment! Man has recklessly cut down the forests, huge factories have been built and the air has become polluted. People have to face various diseases. Among them, various natural calamities such as drought, flood, earthquake are coming to test the people. Global temperature is rising, a new crisis is coming. Another thing that is happening in the 21st century is social inequality! There is huge disparity on many levels like caste, religion, creed, wealth, education.

Keywords: challenges, intellectual progress, Green Revolution, White Revolution, environment

Synthesis, spectroscopic characterization, XRD crystal structure, DFT and antimicrobial study of (2*E*)-3-(4-isopropylphenyl)-1-(4-fluorophenyl)-prop-2-en-1-one

Nutan V. Sadgir

[a*]Research Centre in Chemistry,Mahatma Gandhi Vidyamandir's Loknete Vyankatrao Hiray Arts,Science and Commerce College Panchavati,Nashik-422003,Maharashtra,India

(Affiliated to Savitribai Phule Pune University,Pune)

Corresponding Author Email -nutansadgir@gmail.com

Abstract

The synthesised (2*E*)-3-(4-isopropylophenyl)-1-(4-fluorophenyl) prop-2-en-1-one single crystal is studied by FT-IR, UV-visible, ^{1}H NMR,^{13}C and HRMS methods. X-ray diffraction from a single crystal was used to determine the molecular structure. The aforementioned compound crystallises in the orthorhombic crystal system of the P-21 21 21 space group with unit cell parameters of a = 8.4599 (9), b = 5.8246 (5), c = 29.429 (3) and = 90°, 95.99°, 90°, and Z = 4. In order to compute the molecular geometry and vibrational frequencies (FT-IR) of the title molecule, we used the DFT/(B3LYP) approach using the 6-311++ G (d, p) basis set. We then compared our results to the actual data, which showed good agreement. The UV-visible spectrum is calculated using the TDDFT technique. The parameters of chemical reactivity have also been explored. The findings of the DFT analysis are in good accord with the experimental data. A moderate level of antibacterial activity was detected in the produced compound when it was also tested.

Keywords DFT, Chalcone, XRD, FT-IR, HOMO–LUMO

Antimicrobial activity of medicinally important plant *Artemisia pallens* Wall.

Mulay A.M[1]., Gahile, Y. R[1]. and Nikam T.D[2].

[1]Department of Botany, New Arts, Commerce and Science College, Ahmednagar

[2]Deparetmernt of Botany, Savitribai Phule Pune University, Pune

Email: yogeshgahile@gmail.com

Abstract:

Artemisia pallens Wall commonly known as davana is a small, aromatic plant belongs to family Asteraceae. It is traditionally used in Indian folk medicine for the treatment of diabetes mellitus, immunomodulating and wound healing, anthelmintic, antipyretic, antibacterial, antifungal, tonic properties and also as stimulant. In present study antibacterial activity of four different extracts (methanolic, Ethanolic, petroleum ether and distilled water) of *Artemisia pallens* was evaluated against two gram-positive (*Bacillus subtilis* and *Bacillus cereus*) and two-gram negative (*Escherichia coli* and *Pseudomonas* sps.) bacteria by using standard norms of well diffusion method and streptomycin as standard control. 100µl of microorganisms spread uniformly on nutrient agar medium plate. 100µl extract of different concentration (1µg/ml to 6µg/l) of methanolic, ethanolic, petroleum ether and distilled water extract were added in wells made on nutrient agar medium and incubated at 37^0C temperature for 24 hours. Experiment was carried out in triplicates.

For *E. coli* ethanolic extract showed highest zone of inhibition(7mm) as compare to methanolic (5mm) and petroleum ether (5mm) extract of 6µg/l concentration. Highest zone of inhibition was observed for 5µg/l of petroleum ether extract (13mm) for *Bacillus subtilis*, 6µg/l ethanolic extract (11mm) for Bacillus cereus, and 6µg/l of ethanolic extract for *Pseudomonas* sps. While distilled water extract did not shown zone of inhibition against any bacterial strain. So, methanolic and petroleum ether extract up to 2µg/l will not affect gut bacteria (*E. coli*) which are helpful for healthy person. 3µg/l ethanolic extract shown best antimicrobial activity (7mm ZOI) against *Bacillus cereus* and *Pseudomonas* sps. as compare to 1µg/l streptomycin (5mm ZOI) as standard, which have pathogenic effect on human being.

Keywords: antimicrobial, Artemisia pallens, bacteria.

(ZOI= zone of inhibition, µg/l= microgram per liter, µl = microliter)

Nanoparticles preparation and Catalytic Studies of Nanoparticles

1*Sudarshan D. Tapsale and S G Patil

[1]Department of Chemistry, Poona College Pune
[2]. Department of Chemistry, M U College Udgir

*Corresponding author: sudarshantapsale@gmail.com

Abstract:

In present work, the synthesis of different nanoferrite nanoparticles and their catalytic study have been discussed in the current work. ferrite nanoparticles were made using the wet chemical synthesis method as a catalyst. The XRD was used to verify the nanoparticles' purity and crystallinity. From the XRD data, the lattice constant and crystallite size were calculated. By using the pulse field hysteresis loop tracer approach at room temperature, the magnetic characteristics of the produced copper ferrite catalyst were investigated. A standard method was used to conduct catalytic investigations on the different ferrite nanocatalyst for the synthesis of various reaction derivatives using various solvents and their Bio applications through various activities.

Keywords: Nanoparticles, Ferrite, X-ray diffraction, catalytic activity

Research Papers on Role of Mathematics in Environment

Khamkar Manisha Tukaram
Department of Mathematics, Shri Dhokeshwar College,Takali Dhokeshwar,Tal-Parner,Dist-A.Nagar-414304

Abstract:-

Math is used in a wide variety of ways in Environmental science, from simply counting the numbers of species in an ecosystem to complex chemistry and physics equation related to the science of energy production within the environment. Mathematics plays a pivotal role in understanding and addressing environmental challenges through modeling, data analysis, optimization, risk assessment, monitoring, and control. This abstract explores the multifaceted role of mathematics in the environment, highlighting its applications in modeling complex environmental systems, analyzing data to discern trends and patterns, optimizing resource allocation, assessing environmental risks, designing monitoring systems, and formulating effective environmental policies.

Through mathematical tools and techniques, researchers and practitioners can gain insights into ecological dynamics, predict environmental phenomena, and devise strategies for sustainable management of natural resources. This tittle underscores the indispensability of mathematics in advancing environmental science and management, ultimately contributing to informed decision-making and proactive measures for environmental conservation and sustainability.

Keyword: Environmental science, Data analysis, Designing monitoring system, Assessing environmental risks.

Policies for Sustainable Development

Jagtap Arti Balasaheb

Department of Commerce, Shri Dhokeshwar College Takali Dhokeshwar, Tal- Parner, Dist.- Ahmednagar

Abstract

Deterioration of social, economic, cultural etc. status adversely affects people's health, reduces economic productivity and diminishes comforts. Adopting the right policy is the need of the hour. They are as follows-

• Big projects should be implemented to alleviate poverty, provide new employment opportunities,
• Subsidies if confirmed or removed will benefit the country in many ways.
• Adopt a market based approach.
• Encourage price reduction, institutionalization etc. to increase sales.
• Property should be divided.
• There should be controls to prevent quality.
• Plan appropriate strategy for domestic and foreign trade growth.
• Social awareness and community participation should be greater,
• There should be essential participation in global economic, social and environmental efforts.

Advancing Sustainable Climate Solutions: Frontiers in Mitigation and Adaptation

CA Rhishikesh Dasharath Khose

Ph.D. Student: Mula Education Society's

Arts, Commerce and Science College, Sonai-414105

Abstract:

Climate change is one of the most pressing challenges of our time, posing significant threats to ecosystems, economies, and societies worldwide. Addressing this challenge requires innovative approaches to both mitigating greenhouse gas emissions and adapting to the impacts of climate change. In this abstract, we explore the cutting-edge frontiers of sustainable development in the realm of climate change mitigation and adaptation, within the broader contexts of science and the environment. By outlining ten key areas where advancements are being made, we highlight the ongoing efforts to address the complex challenges posed by climate change and pave the way for a more sustainable future.

1. **Technological Innovations:** One of the primary frontiers in climate change mitigation is the development of innovative technologies to reduce greenhouse gas emissions. Carbon capture and storage (CCS) is a promising technology that captures carbon dioxide emissions from industrial processes and stores them underground, preventing them from entering the atmosphere. Additionally, advancements in renewable energy integration, such as grid-scale energy storage and smart grid technologies, are essential for maximizing the contribution of renewable energy sources like solar and wind power to the global energy mix.
2. **Nature-Based Solutions:** Nature-based solutions offer cost-effective and sustainable approaches to mitigating climate change while providing additional benefits such as biodiversity conservation and ecosystem restoration. Reforestation and afforestation projects, for example, help sequester carbon dioxide from the atmosphere while restoring degraded ecosystems and enhancing biodiversity. Similarly, ecosystem-based adaptation strategies, such as the restoration of coastal wetlands and mangroves, can help protect communities from the impacts of climate change, such as sea-level rise and storm surges.
3. **Climate-Smart Agriculture:** Agriculture is both a significant contributor to greenhouse gas emissions and vulnerable to the impacts of climate change.

Climate-smart agricultural practices aim to reduce emissions from agriculture while

increasing resilience to climate change. Techniques such as conservation agriculture, agroforestry, and precision farming help improve soil health, conserve water, and enhance crop yields while reducing emissions of greenhouse gases such as methane and nitrous oxide.

4. **Urban Climate Resilience:** As the world becomes increasingly urbanized, cities are on the front lines of climate change, facing risks such as heat waves, flooding, and water scarcity. Building urban resilience to climate change requires a combination of green infrastructure, sustainable urban planning, and community engagement. Green roofs, permeable pavements, and urban parks not only help mitigate the urban heat island effect but also provide valuable ecosystem services such as storm water management and biodiversity conservation.
5. **Climate Finance and Investment:** Mobilizing finance for climate mitigation and adaptation projects is crucial for accelerating action on climate change, particularly in developing countries. Climate finance mechanisms, such as green bonds, climate funds, and carbon markets, help channel investment into renewable energy projects, climate-resilient infrastructure, and sustainable land use practices. Moreover, public-private partnerships play a vital role in leveraging private sector resources and expertise to scale up climate action and unlock new opportunities for sustainable development.
6. **Policy and Governance:** Effective policy frameworks and governance structures are essential for driving climate action at the national and international levels. International agreements, such as the Paris Agreement on climate change, provide a framework for countries to set emissions reduction targets and implement climate adaptation measures. Additionally, national and subnational governments play a critical role in developing and implementing climate policies, regulations, and incentives to promote sustainable development and address climate change.
7. **Community-Based Adaptation**: Engaging local communities in the development and implementation of adaptation strategies is crucial for ensuring their effectiveness and sustainability. Community-based adaptation approaches empower local stakeholders to identify their vulnerabilities to climate change and co-create solutions that are tailored to their needs and contexts. By building local capacity, enhancing social cohesion, and promoting indigenous knowledge and practices, community-based adaptation can help communities adapt to climate change while fostering sustainable development.
8. **Climate Information and Early Warning Systems:** Improving climate

information systems and early warning systems can help communities better prepare for and respond to climate-related hazards such as hurricanes, droughts, and heatwaves. Advances in climate modeling, data collection, and communication technologies enable more accurate and timely forecasts of extreme weather events, allowing governments, businesses, and communities to take proactive measures to reduce risks and protect lives and livelihoods.

9. **Climate Education and Awareness:** Increasing public awareness and education about climate change and its impacts are crucial for building public support for climate action and fostering a culture of sustainability. Climate education programs in schools, universities, and communities help raise awareness about the causes and consequences of climate change, as well as the solutions available to address it. By empowering individuals to take action in their daily lives and advocating for policy changes, climate education plays a vital role in driving social and behavioral change towards a more sustainable future.
10. **Research and Innovation:** Ongoing research and innovation are essential for advancing sustainable climate solutions and addressing the evolving challenges of climate change. Investments in research and development support the development of new technologies, practices, and policies to reduce emissions, enhance resilience, and promote sustainable development. By fostering collaboration between scientists, policymakers, businesses, and civil society, research and innovation drive progress towards achieving the goals of the Paris Agreement and building a more sustainable and resilient world for future generations.

In conclusion, this abstract highlights the critical importance of advancing sustainable climate solutions to address the urgent challenges posed by climate change. By exploring the frontiers of climate change mitigation and adaptation, we can identify opportunities for innovation, collaboration, and action to build a more sustainable and resilient future for all. Through a combination of technological innovation, nature-based solutions, policy support, community engagement, and research and innovation, we can accelerate progress towards a more sustainable and climate-resilient world. However, achieving this vision requires collective action at all levels of society, from individual choices to international cooperation, to address the root causes of climate change and build a more sustainable and

Study of the diversity of flora Hanga river basin, Ahmednagar District, Maharashtra (India).

Anuradha A. Kamble, Pratiksha S. Jadhav*, Riyaj R. Inamdar*, Narayan M. Ghangaonkar*, Ranganath K. Aher.
Department of Botany, New Arts, Commerce and Science College, Parner Ahmednagar. 414302.
* Department of Botany, P.G. and Research Centre, Chandmal Tarachand Bora College of Arts, Commerce and Science Shirur, 412210

Abstract

The present study was carried out in the Hanga river basins from Ahmednagar district to know the floristic diversity. Study area were selected from the region of Hanga, Waghunde(bk), Waghunde(kh), Ruichattrapati and Chambhurdi. The study carried out will be helpfull to the plant strategies for the conservation of threatened and endangered, endemic plants, overall 54 species were recorded during the study, this study will contributed in developing natural aesthetic value in reaching human well-being. Major plants belong to the family *Asteraceae, Laminaceae, Solanaceae, Fabaceae.* It can help in development of pharmaceuticals and biotechnological innovations.

Keyword: Parner, Floristic, Diversity, Ahmednagar.

Ecological Crisis In Amitav Ghosh's '*The Hungry Tide*'

Ashok V. More
Assistant Professor in English,
New Arts, Commerce and Science College, Parner
postcol2019@gmail.com

Abstract:

Ecological challenges are critical to national growth. Typically, progress is hampered by the unexpected arrival of humans, which disrupts ecological and unbalanced biodiversity. Amitav Ghosh's literary works addressed environmental issues and highlighted how they affect the ecosystem. Migrants and the underclass suffer as a result of over-settlement, over-urbanization, and deforestation throughout India. This study aims to investigate the ecological crisis that impedes environmental protection. The Sundarbans, a coastal region between India and Bangladesh, revolves around water. Water swallows and regurgitates land with each tide cycle. The 1970s tiger protection initiative in the Sundarbans leads to the ruthless state-led displacement of Bangladeshi refugees from the islands. In 2000, the government imposed significant portions of the islands on a private business for an ecotourism project. These events are the backdrop for Amitav Ghosh's novel *The Hungry Tide*. The novel recounts the first incident and presents a political critique of the second development. This study investigates the author's use of water as both a metaphor and a material presence in the text to examine how the novelist articulates the rupture of social hierarchies and expresses dissatisfaction with the violation of human rights for conservation.

Keywords: Ecosystem, Environment, Biodiversity, Over-urbanisation, Deforestation

Study of Impact of Allelochemical as a Bio weedicide for Sustainable Agriculture

S. R. Yeole, S. K. Aher, R. K. Aher,

Research Scholar, Department of Botany, New Arts, Commerce and Science College, Parner, District: Ahmednagar Pin Code:414302

Research Guide, Department of Botany, New Arts, Commerce and Science College,

Co- Guide, Department of Botany, New Arts, Commerce and Science College,

Abstract:

The plants are the richest source of different chemical compounds. It is identified that most of the chemicals present in the plants plays an important role as an active ingredient for controlling the germination of seeds and affect the growth of another plant. It is found that these secondary metabolites synthesised by the plants acts as herbicides and contribute significantly in the process of weed management. These allelochemicals are not produced at all the times by the plants. It is produced by the plants occasionally only when they are injured or infected by pernicious microorganisms.

The concentration of allelochemicals differs from part to part in plants. Along with growth, allelochemicals also affects on morphological, physiological, and anatomical process and compete with weeds. It is observed that weeds have created tremendous challenges to the farmers in the realm of agriculture. The weeds are also causing less yield and responsible for financial problems to the farmers. It is proved that crops like sorghum, barley, rye and sunflower have the potential to suppress the growth of the weeds. The allelochemicals helps in growing healthy crops sans weeds and diseases.

This research paper is an attempt to investigate impact of allelochemical as a bio weedicide for sustainable agriculture.

Keywords: Allelochemical, Secondary Metabolism, Weed Management, Agriculture

Soil Fertility Improvement by Soil Microorganisms.

A. T. Ayanar[1] and A. R. Tuwar[2]
Department of Botany and Research Centre, Mula Education Society's, Arts, Commerce and Science College Sonai, Tal. Newasa, Dist. Ahmednagar. 414105 (Affiliated to Savitribai Phule Pune University Pune)
Email* – ashaayanar45@gmail.com

Abstract

Soil is an important part of earth. It is like a No Soil No life on the earth. Soil provide platform for plant life cycle and other elements on the earth. Plants provides food material, oxygen and plant part for different purposes to all type of organism. Soil texture and it's fertility is very important for plant growth.Soil Fertility enhanced by microorganisms present in soil such as in Algae, Fungi, Bacteria etc. Some microorganisms are used as biofertilizer which enhances soil fertility and help to incressed nutrients uptake in plant from soil. Algae like Blue green algae, Fungi like Trichoderma and bacteri like Azatobacter used as biofertilizer which enhances soil fertility.

Key words- Soil Fertility, Microorganisms, Algae, Fungi, Bacteria

Global Warming

Swati Laxman Sagar,
Ramesh Phirodia College, Sakur.

Abstract:

According to geological chronology, the temperature of the earth is constantly changing. Currently the average temperature of the world is 15 degrees. Geological evidence suggests that past temperature patterns were different from current temperature patterns. In some places the temperature is high and in some places it is very low. But the current warming seems to be happening very fast. The increase in temperature due to natural events has exceeded the increase in temperature due to man-made events. In this paper, the evidence, causes, effects and measures of global warming are studied in detail.

Keywords: Global Warming, Causes of Global Warming, Measures to Control Global Warming.

Introduction:

The definition of recent and future increases in Earth's average temperature explains global warming and human interactions. The average temperature of the earth's surface and sea water is increasing rapidly. During the period from 1905 to 2005, the average temperature increase of the earth was 0.74 to 1.33 F. It has increased so much. And the main reason is the increase in greenhouse gases.

Global temperature is increasing due to human intervention. After the Second World War, coal and mineral oil were used for fuel in such a huge amount that the amount of carbon-dioxide in the air is increasing. One reason for this is the rise in temperature. Due to the use of latest researches and modern techniques in the advanced countries of the world, the amount of carbon-dioxide is increasing and it has resulted in the increase in temperature.

Definition:

1) "An increase in the average temperature of land surface and sea water due to various natural and human activities which leads to the destruction of all living things. This is called global warming."

2) "Global Warming is the continuous increase in the surface temperature of the Earth."

Evidences of Global Warming:

1) Temperature records.

2) Melting of ice caps in mountainous and subcontinental regions.

3) Global warming of ocean waters.

4) Sea/sea level rise.

5) Snow line in tropical and sub-tropical mountain regions will rise above/higher.

6) Spread of diseases from tropical regions to temperate and polar regions.

7) Seasonal shift of air condition and change in rainfall pattern.

Increase in Air Temperature:

The temperature increase during the twentieth century is about 0.5° to 0.7°C. was. The twentieth century was considered the warmest century in the last two thousand years. Global temperature records began in 1880. The 1980s and 1990s were the warmest decades.

Major causes of Global Warming:

1) Additional use of fossil fuel: Fossil fuel is used in automatic vehicles such as cars, railways, its partial combustion produces carbon-dioxide and increases the heat which helps in temperature rise.

2) Thermal Power Generation: Thermal power generation plants use coal and mineral oil as fuel. This fuel combustion produces a large amount of carbon dioxide.

3) Forest fires: Large forest fires are increasing due to natural and human activities. Fires that have been going on for several months are not controlled, so carbon-dioxide is produced and mixes with the atmosphere.

4)Industrialization: Combustion process is going on in large factories, carbon-dioxide is released from the exhaust of factories, which helps in temperature rise.

5) Deforestation: Due to massive deforestation for industry, agriculture and fuel, the lands and hilly areas are becoming desolated, so the surface heats up quickly and helps in temperature rise.

6) Ocean Water Pollution: Accidents of fuel-carrying ships and many other reasons are increasing the accumulation of oil and other pollutants on the ocean surface, reducing the ability of ocean water to absorb carbon dioxide. This is also having a very wide impact on temperature rise.

7) Increasing Use of Air Conditioning and Refrigeration: The use of these devices is increasing in big cities and industrial areas. Chlorofluorocarbons used in such devices cause ozone depletion. Due to this, the ultraviolet rays of the sun have entered the lower atmosphere and the temperature has started to rise.

8) Use of Chemical Fertilizers: Chemical fertilizers are widely used in agriculture to increase production. The use of chemical fertilizers releases nitrous oxide gas. This helps in increasing the temperature of the gas.

9) Increasing use of cooking gas: Methane gas is used in fuel gas for cooking. With the increasing use of air, the amount of methane entering the atmosphere from the gas mining and refining sector is increasing. Since the heat absorption capacity of methane gas is many

times higher, it increases the temperature of the atmosphere.

10) Water vapour: Water vapor in the atmosphere is considered as a major greenhouse gas. The temperature is increasing due to the increase in the amount of other gases in the atmosphere. With increasing temperature, the amount of water vapor in the air is increasing due to the increase in evaporation. And increasing water vapor is again helping to increase the temperature.

11) Melting of Ozone Layer: Ozone is an element present in very small amount in the uppermost layer of the atmosphere. Although its quantity in the atmosphere is very small, its function is very important. It is the earth's protective shell. Because the ozone layer acts to block UV rays from the sun reaching the earth, ozone in turn protects the earth. If UV rays reach the Earth, many biochemical elements can be decomposed. If ozone is depleted, less UV radiation from the sun is filtered or blocked, causing a significant increase in Earth's temperature and a decrease in rainfall. This has serious consequences for the entire environment.

12) Automated Vehicles: Pollution caused by automated vehicles is more than any human activity. Due to the fumes of automatic vehicles, gases like chlorofluorocarbon, carbon dioxide, nitrous oxide are mixed in the atmosphere, but also gases like carbon monoxide are mixed in the atmosphere. Since carbon monoxide does not directly absorb energy, it is not included among the major greenhouse gases. But it reacts chemically with hydroxyl compounds in the atmosphere. Therefore, due to the continuous chemical process, the temperature increases. Similarly, carbon monoxide causes temperature rise. It can cause 20 to 40% temperature increase. Considering the amount and effect of carbon monoxide, its warming effect is seen to be twice that of carbon dioxide.

Consequences of global warming:

1) Climate Change: By the middle of the twenty-first century, the Earth's average temperature is expected to increase by 1.50 to 5.50 degrees Celsius. This will have far-reaching effects, reducing the effect of the high-altitude jet stream, changing wind direction, reducing rainfall. Precipitation will be in the form of rain only. The number of hurricanes will increase, the number and severity of floods will increase, drought conditions will increase, sea levels will rise by 20 to 40 millimeters per year, groundwater in coastal regions will become saltier, snowfall will decrease, polar ice will melt, rainfall will be extremely high in some regions and others There will be dryness in the region.

2) Effects on Oceans and Seas: Melting of ice in polar regions and melting of glaciers will lead to rise in sea level. Even if the sea level rises by a few meters, low-lying areas in coastal cities like Shanghai, Bangkok, Cairo, Kolkata, Venice will be submerged. The delta of rivers

Nile, Ganga, Yangtze, Mississippi will be flooded. Submergence of coastal lowlands of many countries would significantly reduce India's production. An increase in the number of sea storms will damage the coast and submerge islands.

3) Effects on Human Health: Increase in temperature will increase the number of heat stroke. Changes in rainfall and temperature will breed different insects and migrate infectious diseases from the tropics to the polar regions. Higher temperatures and increased humidity will increase skin diseases and respiratory disorders.

4) Effect on ecosystem: Due to increase in temperature many species of life will be destroyed. Ecosystems will be disturbed and this possibility of destruction of ecosystems cannot be ruled out.

5) Increase in natural calamities: Due to increase in temperature, the possibility of major increase in various natural calamities like floods, drought, desertification, water scarcity, deforestation, cyclones etc. cannot be ruled out.

6) Increase in UV rays: An important consequence of global warming is the increased amount of UV rays reaching the earth. Actually ozone gas acts to absorb UV rays but recently due to depletion of ozone, the amount of UV rays absorbed by ozone is decreasing as expected resulting in impact on humans and environment.

7) Impact on agriculture: The impact of temperature rise on agriculture and animal husbandry will adversely affect food production. Infertile land poses serious obstacles to the production of nutritious and quality food, leading to malnutrition, starvation and especially the health of pregnant women.

8) Effects on Mental Health: Direct health effects range from serious hazards like heat stroke to mental disturbances. There are various forms of heat illness, irritability.

9) Increase in Infectious Diseases: There are changes in the transmission of infectious diseases. Diseases like tuberculosis, leprosy, malaria, which are generally found in the tropics, will spread to developed countries like Europe-America. Water scarcity on one side and migration due to flood-like conditions caused by heavy rainfall on the other side will lead to a significant increase in water-borne diseases like typhoid and typhoid. All these health related symptoms are likely to appear in the near future.

10) Sea Level Rise: The major environmental impact will be sea level rise. The huge amount of ice on earth will melt and flow into liquid form. Sea level will rise. Due to this, the low lands, islands, ports of the earth will go under water and the first hit of this natural disaster will be the ports like Mumbai, Calcutta, New York.

11) Accelerated Evaporation: Increase in temperature will increase the rate of evaporation and decrease rainfall in Southern Hemisphere while increasing it in Northern Hemisphere.

This will lead to extremely dry and intense summers and droughts on the one hand and excessive rainfall, floods and storms on the other hand.

12) Soil Erosion: Increase in temperature will lead to soil erosion. Water reserves will decrease. Agricultural yields will decline and terrestrial and aquatic life will be threatened.

13) Changes in pollution and infection patterns: Changes in the currents of the Mediterranean and Atlantic oceans will also lead to changes in pollution and infection patterns.

14) Invasive vegetation: Invasive vegetation in rivers and seas will benefit from this global warming. Increased carbon dioxide levels will add to it. Animals and plants have to fight for survival. Adapting to a changing environment will lead to unnecessary stress. There will be large-scale migrations and the overall balance of nature on earth will be disturbed. An environment conducive to the growth of weeds, insects, pathogens, bacteria and viruses that are harmful to agriculture will be created.

15) Rain over ocean instead of land: Due to increase in land temperature the temperature over ocean will decrease and wind direction will be from land to sea instead of from ocean to land. So rain will fall on the sea instead of land.

16) Risk of Floods and Disaster to Coastal People: Rivers originating in snow-covered regions will rise in level and people living along the river face floods. Similarly, due to the melting of ice, the water level in the sea increases and the coastal people have to face natural calamities like floods. Thus it is very important to control the global temperature. Otherwise the decline of life is inevitable in the next few years.

Measures to control global warming:

1) Tree conservation: The first thing that comes to mind when thinking about global warming is controlling carbon dioxide. If this control cannot be achieved with minimum use of energy, it is necessary to plant trees. For that, it is necessary to increase the amount of land under forest area.

2) Sequestration of Carbon Dioxide: Coal and petrol are mainly burnt to produce energy, be it for factory work, household electricity or driving vehicles. Carbon dioxide is emitted from this combustion. At present, the solutions suggested by the scientists are being developed to prevent the combustion process and the release of carbon dioxide into the atmosphere. In these processes mainly carbon dioxide is separated from coal after combustion and the separated carbon dioxide is stored in underground open pits. These processes include There are various techniques for sequestering carbon dioxide.

3) Storage of carbon dioxide: This type is very new to science. An alternative is to bury the carbon dioxide separated from the above process underground or release it into the deep sea.

If the carbon dioxide is to be captured and stored, appropriate changes will have to be made in the currently functioning power generation projects. Future power generation projects will have to be planned keeping this point in mind.

4) New types of fuels: Capture and storage of carbon dioxide after combustion is possible in power generation plants. Because a large amount of pollutants are produced there. Since this formation is of central type, it is easy to find a solution; But this combustion takes place in vehicles. Carbon dioxide is also emitted from there. Capturing this carbon dioxide is a very difficult task. The solution is to find new types of fuels, so that these fuels do not emit carbon dioxide. Hydrogen, biological fuels can be used as an alternative for this.

5) Consideration of non-conventional energy sources: At present most of the countries are focusing on the production of non-conventional energy sources. Non-conventional resources are resources in which mineral resources are not exploited. Some of the non-conventional energy sources are hydroelectricity, windmills, various forms of solar energy, biogas generation, aeration of agricultural crops, hydroelectricity from tidal currents.

6) Nuclear Energy: Nuclear energy is energy derived from atoms. Nuclear power does not emit green gases. But due to the problem of radiation, the safety of nuclear reactors requires great care.

7) Economic, Legal and Social Solutions: The economic, legal and social solutions to global temperature rise are as follows.

A) Tax on emissions: A better solution is to tax excess emissions of greenhouse gases. This tax can be levied directly on fuel. Or it can be done by calculating the amount of green gases emitted by an industry after the consumption of fuel. Higher taxes are expected to restrict fuel consumption and industry is expected to invest more in new types of non-green fuels.

B) Imposing sanctions: imposing economic sanctions on countries or industries that do not care about emissions of greenhouse gases so as to limit their greenhouse gas emissions and begin to consider alternatives.

C) Carbon Credit: Developed countries are required to make major domestic changes to reduce emissions of green gases under the Kyoto Protocol. Such changes could lead to bankruptcy for some countries even when the appetite for growth is great. Social issues are also likely to arise. For this, carbon credit has been facilitated under Kiln Development Mechanism in Kyoto Protocol.

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Effect Co^{60} g-ray irradiation on the structural and morphological properties of CoZnF NPs and their major applications

Ram S. Barkule
Department of Physics, Sundarrao More Arts, Commerce and Science College, Poladpur, Raigad-402303, Maharashtra, India

Abstract

The $Co_{1-x}Zn^xFe_2O_4$ ($0.2 \leq x \leq 0.8$) spinel ferrite nanoparticles (CoZnF NPs) were successfully prepared by sol-gel auto-combustion method using citric acid as a complexent performing important role to drive the chemical reaction. The pH of the solution was kept to 7 with an addition of ammonia solution (NH_4OH) solution in order to maintain the stability in the solution. Single phase; cubic spinel structure of CoZnF NPs; space group Fd_{3m-1} was confirmed through obtained XRD pattern. A mean crystallite size (t), lattice parameter (α) and other structural and morphological parameters before and after gamma irradiation were studied to show the effect of Co60 γ-irradiation with a total gamma dose of 5 Mrad on the physico-chemical properties of the material. The topography of the CoZnF NPs was analysed using the AFM images. The Raman spectroscopic analysis have shown the particular active modes Eg, $3T_{2g}$, and A_{1g}. The UV–V is spectroscopic absorption of CoZnF NPs was reported at ~254.09 to ~ 258.73 Å and the optical bandgap was found with the help of Tauc's plot; Kubelka-Munk function F(R); that was reported to be 3.51–3.96 eV.

Keywords: XRD, SEM, AFM, Raman, Gamma irradiation

Cyber Crime and Security

Rupali Gorde

Department of Computer Science,

Shri Mulikadevi Mahavidyalaya Nighoj.

Abstract

Cybercrime first started with hackers trying to break into computer network. Cyber security is all about protecting computers, network and data from unauthorized access or attacks. It involves measures like using strong password, keeping software update, and being caution with email attachment and suspicious link. it is super important in today's digital world. cyber security is fascinating field that focuses on keeping our digital world safe. it involves techniques like encryption ,fire wall and antivirus software to protect against hackers and cyber threats. it's like having a virtual bodyguard for your online presence. cyber crime are criminal offenses committed via the internet or otherwise aided by various forms of computer technology such as the uses of online social network to bully others or sending sexually explicit digital photos with smart phone. cybercrime is that activities made by the people for destroying orgnisation network stealing other valuable data, document, hacking bank account and transferring money to their own and so on.

Key word: Cyber crime, Hacking, Cyber security, Technology, computer software.

To study of Carbohydrate, Protein and Lipid of Freshwater Edible Gastropod (Bellamya bengalensis) with regarding seasonal variation Ahmednagar District, Maharashtra.

I. R. Ustad, S.B. Pagare
(Zoology Department)
Sir Sayyed College, Aurangabad. .
sp9214812@gmail.com
9021076428, 9860976134

Abstract

To study fresh water gastropod Bellamya bengalensis the main study was carried out to determine the seasonal variation of carbohydrate, protein & lipid. this work carried out during the period between January-2022 to December 2022 For this study animals collected from in four selected study sites of Ahmednagar district . this selection site four was 1.gavaliwada water fall in vilad village 2. malvadi talav near nimbalak village and , 3. kapurvadi lake in kapurwadi village and 4.jamb kaud lake and wet land jammbh village For biochemical analysis, outer shell of the gastropods were removed, deu to in metabolism which is affected by sesonal variation animal come under the stress. For this study flesh were used dried condition. The level of protein is remain higher deu to avaibality of food . during this study detection occure in protein carbohydrate and lipid level.. Protein, carbohydrate, lipid were the maximum during Pre-monsoon period than monsoon & post-monsoon period. This study shows with regarding different season gastropod Bellamya bengalensis shows various changes occure in biochemical constitutes.

Key Words: Bellamya bengalensis, malvadi lake, kapurvadi lake , Nutritional value, Seasonal variation.

Introduction

1.Molluscs are used widely for various purpose like human consumption , poultry feed, fish feed, lime fisheries etc. Pila globosa and Bellamya bengalensis are harvested commercially as fish feed to the shrimps farm in local areas . The edible part are motor mussel, mantle and adductor mussel. Mostly all the species of molluscs contains high amount of protein, moderate amount of carbohydrate and little fat. Reeta KumaRi and Faquiya Khatoon (2021) 13.the freshwater mollusk are suspensory feederon primary stage of food chain ,hence they are notable change influence the organization and fluctuating of ecosystem(mangesh Jadhav and arun gulve 2012)Freshwater molluscs are used as supplementary protein source in many countries like India (Rao Subba and Dey, 1989), Molluscs especially, gastropods and bivalve

are important food sources of human. Gastropods are generally Preffered in the state of Bihar, Jharkhand, maharastra. They are good source of carbohydrate, protein, steroids, minerals, especially calcium iron, zinc and copper and vitamins such as vitamin B-12) (Baby et al.., Ghosh et al., 2017).1. the phylum mollusca is the second largest group of the animal kingdom occurring in various habitat and is divided into freshwater marine and terrestrial form they prove immensely beneficial both economically and medicinally wosu lo (2003)2.during seasonal change ,climate as well as temperature changes occure ,that directly exerted the effect on bellamya bengalnesis population during post monsoon period bellamya bengalnesis population remain in astivation condition deu to hot climate and dryness of summer.at early monsoonal season as well as mid post monsoonal season identified as their breeding season.T .samanta A.jana 2023)3.Studies on the metabolic change which unable bivalve survive such as stess full environment have been carried out recently many investigator. A.de ZWAAN AND D.I ZANDEE 1972) 4.Cyclical change in biochemical composition of animal tissue are mainly study to assess the nutritive status of an organism (Shetty et.al.,2013) 5.Fresh water snails constantly face desiccation, occasioned by drying up of surface water from fresh water bodies either regularly in a seasoned manner or occasionally due to unusual rainfall. At such times, the snails enter a its normal life cycle once favourable conditions reappear (Richards, 1967). 1.Freshwater molluscs are also used as bio-monitoring agents in the aquatic ecosystem and in integrated fish farming (Sicuro 2015) 7.Molluscan communities are sensitive to certain chemicals; many species are excellent water quality indicators of localized conditions. the physico-chemical parameters of both soil and water play a significant role in growth and survival of molluscs population(Smitha and Mustak MS 2017)9.Protein is the most important organic compound of animal tissue. Protein occurs in the body in the form of amino acids and other metabolites, which serve as building blocks of the body (Vijayavel et. al., 2007). the protein decreases in organism due to largest need of energy for the metabolic process which leads to increases utilization of protein to meet energy and increase the proteolysis to reach the high energy demands under heavy metal stress in fresh water bivalves (Patil, 2011). 12.As environmental condition changes,it shows effect on protein content in the tissue like mantel ,hepatopancreas,foot and gonad. (D.B. Sable and A.N.Vedpathak 2017) 11.Changes in glycogen content are due to temperature, size, growth, reproductive status and availability of food. Accumulations of glycogen take place during their growing season and use them during rest of life (Suryawanshi A. V. and Kulkarni A. N. 2019) 12.As environmental condition changes,it shows effect on protein content in the tissue like mantel ,hepatopancreas,foot and gonad. (D.B. Sable and A.N.Vedpathak 2017) 14.there is significant changes in the protein content in different body tissue according to seasonal

variation. (mangesh Jadhav and arun gulve 2012)15.metabolism in gastropoda varies in response to environmental change ,food avaibality and reproductive cycle .many gastropods are capable aestivation –a phenomenon for survival in adverce environmental condition.plumonate snil usualy aestivate during dry periods (K.K chaki et;al.2008) Invertebrate's changes in the biochemical constituents are pronounced which are cyclic in reproduction, since a great amount of energy must be channelized to the gonad during reproduction. The trace metals are known to be non-bio-degradable and highly toxic to most organisms (Kaoud and Dahshan, 2010).

Materials and methods

The present study on freshwater gastropod , Bellamya bengalensis were collected from different ponds and wetlands site of gavlivada water fall (p1) , Malvadi lake(S2) jambh kawad gao wet land and pond (p3) kapurwadi lake(p4)(. *Lat 21˚ 30' - 220 2' N long. 87º 20′- 88º5′ E+ (figure 1). this are the area situated in ahmednagar district. The collections of sample done by hand picking method are made randomly during the period January-2022 to December 2022. Adult Bellamya species (Bellamya sp.) are selected for laboratory experiments. Immediately after bringing to laboratory, the shells of these gastropods are brushed and washed with fresh and clean water to remove algal biomass, mud and other waste material. lowery method used for protein detection.(lowry et;al.1951) Sample preparation and biochemical analysis For biochemical analysis, shell of the Bellamya sp. was removed and flesh was dried with filter paper to avoid the outer water content.The wet weights of all the tissues were taken to the nearest milligram (mg) and they were immediately transferred to the hot air oven maintained at 90°-100° C. The samples were dried for 3 to 4 days for the complete removal of their water content (Ahirrao and Kulkarni, 2011). Dry weight of all the tissues were takenwhen all the moisture was removed and no further change in the weight of the dried tissue was noticed. The dried material was powdered and used for analysis. For biochemical estimations, dry powder was used and its weight was kept practically constant through the experimental work. Carbohydrate was estimated by Kemp et.al. (1954) method, protein was estimated by Lowry et.al. (1951) method and lipid were evaluated by Barns and Blackstock (1975) method.

Results

Protein profile

Month	Site 1	Site 2	Site 3	Site 4
Jan	12.70	10.12	11.15	14.01
Feb	14.05	10.56	14.80	15.20

mar	14.10	11.66	14.20	15.50
April	14.70	12.20	15.10	16.20
May	13.80	11.27	15.20	16.10
Jun	14.00	11.04	14.23	15.18
Jully	13.50	10.23	13.86	15.10
August	13.20	9.82	12.44	14.02
Supt	12.15	9.72	12.02	13.86
oct	13.28	9.28	10.12	12.18
Nov	11.79	6.72	9.23	11.25
Dec	11.20	8.60	9.40	10.02

Carbohydrate profile

Month	Site 1	Site 2	Site 3	Site 4
Jan	12.01	11.12	10.15	12.70
Feb	13.05	10.56	12.80	13.29
mar	13.10	11.66	12.20	13.20
April	12.70	12.20	11.10	12.69
May	11.80	11.27	11.20	12.10
Jun	9.00	11.04	11.23	11.18
Jully	8.50	10.23	11.86	11.10
August	7.20	8.82	12.44	13.02
Supt	6.15	7.72	12.02	13.02
oct	6.28	6.28	10.12	12.18
Nov	7.79	4.72	9.23	11.25
Dec	10.20	8.60	9.40	10.02

Lipid profile

Month	Site 1	Site 2	Site 3	Site 4
Jan	12.70	10.12	11.15	14.01
Feb	14.05	10.56	14.80	15.20
mar	14.10	11.66	14.20	15.50
April	14.70	12.20	15.10	14.20

May	13.80	11.27	15.20	14.10
Jun	12.00	11.04	14.23	15.18
Jully	11.50	10.23	13.86	15.10
August	11.20	9.82	12.44	14.02
Supt	8.15	9.72	12.02	14.86
oct	9.28	9.28	10.12	13.18
Nov	11.79	7.62	9.23	13.25
Dec	11.20	8.60	9.40	10.02

Discussions.

On nutritional perspective of Bellamya bengalensis is still not well studied. The present study was carried out to understand the change in bio-chemical composition (Carbohydrate, Protein, and Lipid) of Bellamya bengalensis through regular collection of this animal from different freshwater water bodies of Ahmednagar district. the aim of this study to identify how seasonally environmental factor affect gastropod that is why change in composition of nutrient in gasstropod Enormous literature is accessible on the toxicity of heavy metals, organ pesticides and insecticides etc. in different aquatic animals related to effect on biochemical constituent levels in different tissues of animals but not so far on seasonal variation. Hence the present study was carried out to evaluate the changes during the seasonal variation on nutritional value of Bellamya bengalensis in different area. The present investigation also showed that these gastropods exhibit total protein, carbohydrate and lipid in pre-monsoon period were maximum due to favorable environmental condition in summer.It was observed that in study site malvadi lake , the protein was lower due to the effect of Ahmednagar MIDC s it was indicated that study on this site the protein was comparatively less than rest study areas' due to environmental pollution and other industries. Other study sites i.e. in case the in kapurwadi lake ,jambh kaudgao lake and gauliwada water fall this water body show good diversity of founa protein content is comparatively high due to less environmental pollution and stress. during summer season protein level become high deu to water level decreased and less activity of the snail and also the effect of environmental temperature. During monsoon sesason February month carbohydrate was maximum in study site 4(kapurwadi lake) (13.29 ± 0.10) probably due to the presence of large number of Phytoplanktonand zooplankton , and minimum in study site 2(malwadi lake) (6.72± 0.10) and in this rigion probably due to the industrial pollution of Ahmednagar MIDC. In post-monsoon study site P2 carbohydrate was maximum (9.23 ± 0.65) and minimum in study site P8 (5.03 ± 0.57). At a glance

carbohydrate showed small variation in the entire study site during monsoon and post-monsoon season. The present study revealed that there was a significant variation in the bio-chemical composition in the flesh of Bellamya according to seasonal change. The organic substances like carbohydrate, protein and lipid play a key role in different metabolic activities. 9.Protein is the most important organic compound of animal tissue. Protein occurs in the body in the form of amino acids and other metabolites, which serve as building blocks of the body (Vijayavel et. al., 2007). The present study showed that protein was maximum during summer season i.e. in the pre-monsoon and very minimum during post-monsoon, probably due to the variation of environmental temperature. It was observed that protein, lipid and carbohydrate were low in post-monsoon probably due to sedentary life without much activity. Similar results were observed by Pandit (2005) in Lamellidens marginalis of Godavari River.The lipid was found to be more during summer season as due to exposure of mantle and foot to high temperature in summer season .Similar results was observed by Shaikh (2011). The present study revealed that in energy conservation the organism would be expected to make compensatory adjustment to both the components of energy gain and energy loss in the fate of changes in the environmental conditions (Vedpathak, 1989). Shaikh (2011) reported that the lipid molecules deposited in large amount of body tissues and biochemical changes seasonally in L. corrianus. During monsoon season, gonad show maximum amount of lipid, which is correlated with the maturation of gonadal follicle and time of spawning in razor clam, Sinonovacula constricta Hongwei (2008). The present study revealed that during pre-monsoon period lipid was maximum in jamb kaudgaon lake (15.18 ± 0.10) and during mid of winter season it was minimum in malwadi lake(7.62 ± 0.20).

Conclusion : on the present study of fresh water mollusca Bellamya bengalensis showed that the nutrient present in the flesh i.e. protein, carbohydrate and lipid changes occus as per seasonal changes occur and they are also correlated with the changes in environmental factors and aquatic macrophytes also. However, further study is necessary for evaluationary relation and variation in molecular level study. Glycogen is the primary energy store in bivalves which is to be increased or decreased according to the need of the organism ABHED PANDEY 2014

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Scope of Studying Environmental Sciences

Attar Shafiya Yasin
Kasturi Shikshan Sanstha
College of Arts Commerce & Science
Shikrapur, Tal.Shirur, Dist-Pune

Frontiers in Sustainability welcomes submissions in all areas of sustainability science which enable positive change and address environmental, economic and health challenges associated with sustainability. Topics include, but are not limited to:

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Interdisciplinary studies are particularly encouraged, especially those which address sustainability challenges that cannot be tackled in isolation. Frontiers in Sustainability also accepts policy papers which bridge scientific discoveries with policy options and analysis, and practice papers which assess the application of specific practices, processes, technology or resources..

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विज्ञान आणि पर्यावरणातील शाश्वत विकासाच्या मर्यादा"

Dr P.R. Bodke
Assistant professor, Department of Political Science,
Shri Sai Baba College Shirdi .
Tq Rahata, Dist -Ahmadnager (Maharashtra)
Email ID -manishabodje30@gmail.com.
Mob No-9766828588

संक्षिप्त गोषवारा:-

एखाद्या विषयाच्या व्यवस्थित रीतीने केलेल्या अभ्यासास विज्ञान असे म्हणतात. विश्वातील घटना व घडामोडी यांचे बुद्धिनिष्ठ, कार्यकारणाधिष्ठित असे आकलन होण्यासाठी मानवाने केलेल्या क्रिया व त्यांचे फलित म्हणजे विज्ञान होय. पर्यावरण म्हणजे सजीवांचा नैसर्गिक परिसर होय. तर .शाश्वत विकास (Sustainable Development: लघुरूप:एस.डी.) ही भविष्यकालीन आंतरराष्ट्रीय विकास संबंधित संकल्पना आहेआहे. जी युनायटेड नेशन्स ने बनविली आहे. जो विकास पिढी दर पिढीच्या मूलभूत गरजा धोक्यात न आणता पूर्ण करतो, त्याला 'शाश्वत विकास"असे म्हणतात . शाश्वत विकासामध्ये आपण मनुष्याच्या विकासासाठी निसर्गाचा अशा प्रकारे वापर केला पाहिजे की निसर्गा आणि पर्यावरणाला हानी पोहोचू नये आणि निसर्ग आणि विकासामध्ये संतुलन राखले जाऊ शकेल. जो विकास पिढी दर पिढीच्या मूलभूत गरजा धोक्यात न आणता पूर्ण करतो, त्याला 'शाश्वत विकास', असे म्हणतात. मनुष्य शाश्वत विकास करत असताना त्या पुढे काही पर्यावरणाच्या मर्यादा आहेत त्यामध्ये प्रामुख्याने. सतत वाढत जाणारी जगाची लोकसंख्या ,वस्तू, सेवा, राहण्याची जागा आणि शेतजमिनीची वाढती मागणी . या गरजांमुळे नैसर्गिक संसाधनांचा ऱ्हास होतो, परिसंस्थांचा नाश होतो आणि प्रदूषणात वाढ होते ज्यामुळे पर्यावरणीय शाश्वतता प्राप्त करणे कठीण होते. भविष्यातील पिढ्यांसाठी नैसर्गिक संसाधनांचे जतन करणे ही शाश्वत विकासाची मुख्य चिंता आहे. नूतनीकरणीय ऊर्जा संसाधनांचा वापर करणे आणि नजीकच्या भविष्यासाठी अपारंपरिक ऊर्जा स्रोतांची बचत करणे मानव आणि पर्यावरणाच्या दृष्टीने महत्त्वाचे आहे.

शाश्वत विकासाचा आपल्या समाजावर सर्वतोपरी परिणाम होतो. सामाजिकदृष्ट्या, शाश्वत पद्धती सामुदायिक बंध मजबूत करण्यास, जीवनाचा दर्जा सुधारण्यास आणि चांगल्या भविष्यासाठी आशा प्रदान करण्यात मदत करू शकतात. पर्यावरणीयदृष्ट्या, शाश्वत पद्धती नैसर्गिक संसाधनांचे संरक्षण करण्यास, वातावरणातील बदलांना कमी करण्यास आणि त्यांच्याशी जुळवून घेण्यास आणि जैवविविधतेला प्रोत्साहन देण्यास मदत करू शकतात. मानवी क्रियाकलापांच्या परिणामांशी आपण झगडत असताना पर्यावरणीय अभ्यास आणि शाश्वत विकास हे अधिकाधिक गंभीर विषय बनले आहेत. वातावरणातील बदल, जैवविविधता हानी, प्रदूषण आणि संसाधनांचा ऱ्हास यासारख्या पर्यावरणीय समस्यांकडे लक्ष देण्याची निकड कधीच जास्त दाबणारी नव्हती. ही आव्हाने प्रभावीपणे कमी करण्यासाठी आणि त्यांच्याशी जुळवून घेण्यासाठी आम्ही आंतरविद्याशाखीय दृष्टिकोन शोधणे, वैज्ञानिक ज्ञान आणि धोरण फ्रेमवर्क एकत्रित करणे आणि शाश्वत पद्धतींमध्ये गुंतणे हे सर्वोपरि आहे. 2000 ते 2015 या कालावधीत मिलेनियम डेव्हलपमेंट गोल्स (MDGs) वर निर्माण करून 2015 मध्ये युनायटेड नेशन्सने दत्तक घेतलेल्या शाश्वत विकास उद्दिष्टांची (SDGs) विस्तृत श्रेणी संबोधित करणे आणि कव्हर करणे हे ESSD चे उद्दिष्ट आहे.

पर्यावरण विज्ञान आणि अभ्यास पर्यावरणीय समस्यांच्या वैज्ञानिक, सामाजिक आणि सांस्कृतिक पैलूंचे परीक्षण करतात. पर्यावरणाचा विषय पर्यावरणीय समस्या ओळखणे, समजून घेणे आणि त्यांचे निराकरण करण्यासाठी संबंधित असलेल्या समजून घेण्याचे प्रकार समाविष्ट करतो. पर्यावरणीय समस्या आणि उपाय वैविध्यपूर्ण आहेत. शाश्वत विकास शाश्वततेच्या चार स्तंभांवर आधारित आहे: सामाजिक, आर्थिक, तांत्रिक पर्यावरणीय स्थिरता. पर्यावरण शाश्वत विकास हा प्रोग्राम किंवा अनुप्रयोगाची चाचणी, विकास आणि डीबग करण्यासाठी साधने आणि प्रक्रियांचा संग्रह आहे..पर्यावरण शाश्वत विकास आर्थिक, पर्यावरणीय आणि सामाजिक आणि तांत्रिक माध्यमांद्वारे गरिबी, ग्लोबल वार्मिंग, ऍसिड पाऊस, प्रदूषण वाढते शहरीकरण, कचरा विल्हेवाट, हवामान बदल आणि बरेच काही कमी करते.

विज्ञान आणि पर्यावरणाच्या दृष्टिकोनातून.शाश्वत विकास साध्य करण्यासाठी, आर्थिक वाढ, सामाजिक समावेशन आणि पर्यावरण संरक्षण या तीन मुख्य घटकांमध्ये सुसंवाद साधणे महत्त्वाचे आहे. हे घटक एकमेकांशी जोडलेले आवश्यक आहे. आणि हे तीनही घटक सर्व व्यक्ती आणि समाजाच्या कल्याणासाठी महत्त्वपूर्ण आहेत..शाश्वत विकासासाठी पर्यावरण कायद्याची अंमलबजावणी कठोरपणे आवश्यक आहे . तरच पर्यावरण आणि शाश्वत विकास यांच्यात समतोल साधला जाईल.