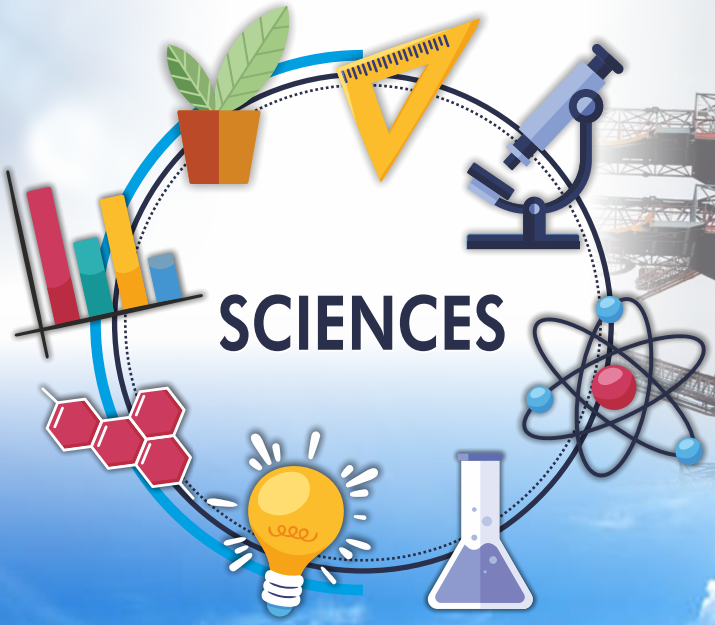
Bharati Vidyapeeth's

Dr. Patangrao Kadam Mahavidyalaya, Sangli

Fourth National Conference on

Recent Trends In Pure And Applied Sciences (RTPAS-2022)

21st and 22nd January 2022



Souvenir

Bharati Vidyapeeth's

Dr. Patangrao Kadam Mahavidyalaya, Sangli

Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS-2022)

Friday and Saturday, 21st & 22nd January 2022

Organized by

INTERNAL QUALITY ASSURANCE CELL

Souvenir

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Message from Secretary

We are happy to host the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022)" organized by Internal Quality Assurance Cell, Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli on 21st and 22nd January, 2022. The main objective of this conference is to provide a platform for researchers, scientists and industrialists to explore, cooperate, promote and motivate the participants towards the pure and applied sciences to achieve societal sustainability goals.

I welcome all the delegates to the Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli for the virtual national conference and wish the organizers all the very best. I believe that the outcome of the conference will help to apply the findings to live a better life and benefit mankind at large.

- Dr. Vishwajeet Kadam
Minister of State-Co-operation,
Agriculture, Social Justice, Food,
Civil Supplies and Consumer Protection
Minorities Development, Marathi Bhasha,
Government of Maharashtra Secretary,
Bharati Vidyapeeth Deemed University, Pune
Pro Vice Chancellor,
Bharati Vidyapeeth Deemed University Pune.

Message from Chancellor

I am happy to note that the Internal Quality Assurance Cell, Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli has taken this initiative in organizing the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022). I believe that all the delegates from multi-discipline of sciences will find something as value addition to their pursuit of career by attending the conference.

In recent times humanity is struggling with issues on how to make our livelihood more comfortable. I am very grateful towards the organizers for selection of conference theme that is "COVID-19 Impacts: New Challenges to Science, Technology, Economy and Humanity". The fruitful discussion on COVID-19 is very necessary and important as it is directly related to our survival.

Exploration of the theme regarding pure and applied science hold promising opportunities not just to academician for erudition, but also for making our human life better and more viable on the earth. In this regard, I believe that the conference will serve as a channel to bring experts and scholars together. These scholars through their contribution, ideation, paper presentations will give us something valuable to look forward and fortify our trust in a world that holds hope and a better future.

- Dr. Shivajirao Kadam
Chancellor,
Bharati Vidyapeeth Deemed University,
Pune

Message from Vice Chancellor

Bharati Vidyapeeth Deemed University Pune is happy to acknowledge that Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya is organizing the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022).

The proactive initiative of the faculty and staff of the Dr. Patangrao Kadam Mahavidyalaya is noteworthy in organizing this conference. I believe it will pave way for stimulating minds and coming up with the solutions to the many challenges that our world is facing today.

This conference will definitely be a big platform for all disciplines of the science to share their views and comments as well for sustainable development of the Nation. Organizers have taken painstaking efforts for the commencement of the conference.

I welcome you all to this conference and hope the papers and abstract presented, ideas shared, complied here in this abstract book will go a long way in making a positive impact on the academic and actual world of ours today and in the days to come.

- Dr. Manikrao Salunkhe
Vice Chancellor,
Bharati Vidyapeeth Deemed University,
Pune

Message from
Vice Chancellor

Today the world is changing in rapid strides. Technology, science and communication have an impact on our lives like never before. The whole world is facing the impact of COVID-19 and trying to live in such critical conditions. As a human, we have the choice to change and adapt the changes for survival. In this connection, Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya is organizing the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022) with the theme 'COVID-19 Impacts: New Challenges to Science, Technology, Economy and Humanity'.

I hope the conference will prove to be a catalyst in bringing desirable positive change in our attitude, perspective and efforts so that we may come together with better ideas, solutions and suggestions that can impact our lives favourably.

I wish the RTPAS–2022 all the very best!

- Dr. D. T. Shirke
Vice Chancellor,
Shivaji University, Kolhapur

Message from
Pro Vice Chancellor

I am very happy to note that Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya is organizing the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022). The invited talks called in the conference are very important for the benefit of the country. Recent Covid-19 pandemic leads new opportunity to the untiring research. There is a lot of scope in the field of pure and applied sciences. I consider this conference as one of the best platforms for interdisciplinary research to share their work to resolve the current situation.

I am sure that the resource persons will address the scope to bring new possibilities to the forum.

I wish best luck to the conference and organizers.

- Dr. P. S. Patil
Pro Vice Chancellor,
Shivaji University, Kolhapur

Best Compliments from
Principal

As Principal of Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, I take great pride to welcome all to the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022). Research in pure and applied science has become the need of the hour as it is associated with every element of life in the universe. Many sectors have been motionless during Covid-19 pandemic from last two years and hence it needs to be find our concrete solution with perfect planning, we have organized this conference.

We have called eminent scientists from India and abroad as well to discuss the topic of the impact of COVID-19 on the science, technology, economy and humanity. The discussion at this conference will be a great feast for participants and delegates. I appreciate our team of organizers for taking such praiseworthy initiative. I am very happy to inform you that not only invited speakers will deliver their thoughts, but also many researchers will be presenting their work orally and with posters in this virtual conference. We have received more than 70 abstract and 189 participants have registered.

The national conference will provide best podium of the interdisciplinary field of pure and applied science for young researchers. Henceforth, as well, we will strive for encouraging youth and motivating them to achieve societal sustainability goals.

I am honoured to be organizing chairmen of RTPAS-2022 and welcome you all, have a great time.

- Principal Dr. D. G. Kanase
Organizing Chairman
Member, Management Council,
Shivaji University, Kolhapur

Message from
IQAC Coordinator

It gives me an immense pleasure to welcome all participates, delegates and dignitaries to the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS–2022). I feel very much proud to inform you that this is the fourth consecutive national conference that has been organized by Internal Quality Assurance Cell (IQAC) of Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli. I am so honoured to be the Coordinator of IQAC. Our teams tiredless efforts paid off and researchers from all over the country have participated in this national conference, RTPAS-2022.

We wish to continue the same in coming years. We will provide a forum for exchange of knowledge, ideas and learning experiences among the participants and speakers. Thank you all for your cooperation and support.

- Dr. Amit R. Supale
Coordinator,
Internal Quality Assurance Cell

Message of Convener

Greetings from Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya Sangli. It gives me a great pleasure to place before you Abstracts book of the Fourth National Conference on Recent Trends in Pure and Applied Sciences (RTPAS- 2022). The abstract book contains 70 abstracts, covers the aspects of Pure Science, physiology, ecology, taxonomy, environment, ethno-botany and pathology. 07 Research Papers and 19 posters presented by the researchers.

We thank the contributors for their valuable contribution to make the conference successful. We sincerely thank all the members of the advisory committee for their valuable guidance. Finally, we thank Bharati Vidyapeeth's Pune.

Thank you.

- Dr. V. B. Awale
Convener, RTPAS-2022

Secretary
Message

It gives me great pleasure as secretory of this conference to welcome the invited speakers, chairpersons, experts, participants and my colleague to have a great time and entertainment in virtual conference.

I am very happy to inform you that more than 170 participants have registered to this conference out of that there are 100 faculty and 70 students. Our expert review team have selected only 7 oral presentations and 25 poster presentations.

This conference has provided a much-needed platform to the young aspiring researchers and faculty to explore. We aim to bridge the all-Science disciplines together and provide a unique platform for where researchers will discuss the interdisciplinary possibilities in pure and applied sciences.

I am very much grateful to the Research Journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences for supporting our cause and providing platform to the researchers.

- Dr. Dada P. Nade
Secretary, RTPAS-2022

About Bharati Vidyapeeth

Honorable Dr. Patangraoji Kadam, a great visionary and dynamic leader has laid the foundation of Bharati Vidyapeeth. Today Bharati Vidyapeeth conducts more than 180 educational units of various kinds, right from pre-primary schools to postgraduate institutions and a full fledged professional university (BVDU). During the last 57 years, Bharati Vidyapeeth has made astonishing strides in the field of education, particularly, higher and professional education. It has its major campuses in New Delhi, Navi Mumbai, Pune, Solapur, Kolhapur, Sangli, Karad, Satara, and Panchgani and at quite a few other places.

About the College

The college was established on 16th September 1985, as Arts, Science and Commerce College, Sangli, and it was renamed as Bharati Vidyapeeth Dr. Patangrao Kadam Mahavidyalaya, Sangli on 8th January 1999. The college has a spacious and beautiful building, with well-equipped laboratories, classrooms, ICT enabled classrooms, auditorium, two open stages, landscape garden and a playground. The college was granted permanent affiliation in the year 1997, by Shivaji University, Kolhapur. The college is trying to bridge disparity between the rural and urban culture with our parent institution motto,'Social Trans for mation through Dynamic Education'. Recently, the UGC, New Delhi has granted two diploma courses under Community College Scheme. The college is also selected by DST, India to develop instrumentation facilities under FIST scheme. We are the proud recipients of the Best NSS unit Award of Government of Maharashtra for our substantial work through National Service Scheme. For more details please visit http://dpkmsangli.bharatividyapeeth.edu/

About Conference

The objective of this conference theme is to provide a platform for researchers, scientists and industrially relevant to explore, cooperate, promote, motivate the participants in the science to achieve societal sustainability goals. We invite the research papers from all science and technology subjects. The theme of conference is “COVID-19 Impacts: New Challenges to Science, Technology, Economy and Humanity”.

Objectives

- To bring together eminent Indian scientists, University Professors, Research and PG students to explore the cooperative program and research opportunities.
- To give exposure to the students so as to ignite an interest in them about the fascinating world of Pure and Applied Science and technologies.
- To strengthen and expand the collaboration between college and universities as well as national research institute for research work.
- To create a platform by open discussion and paper presentation before the eminent Indian scientists.

Fourth National Conference on
Recent Trends in Pure and Applied Sciences (RTPAS–2022)

On 21st and 22nd January, 2022

Technical Program Schedule

Day First, 21st January, 2022			
Time	**Speaker**	**Chairperson**	**Member**
Inaugural Function			
11:00 am - 12:00 am	**Chief Guest** **Dr. Arun Patil** Vice Chancellor, Sanjay Ghodawat University, Kolhapur	**President** **Dr. D. G. Kanase** Principal, Member of Management Council Shivaji University, Kolhapur	**Mrs. B. K. Bhavikatti**
Session I			
12:00 pm – 12:30 pm	**Dr. Sanjeev P. Maradur** Associate Professor, Poornaprajna Institute of Scientific Research	**Dr. S. R. Sabale** Assistant Professor, P.G. Department of Chemistry, Jaysingpur College, Jaysingpur	**Dr. A. R. Supale**
12:30 pm – 12:45 pm	*Production and characterization of biomass derived porous activated carbon for environmental applications* **Amruta Koli, Akshata Pattanshetti, Rohant Dhabbe, Amit Supale, Sandip Sabale**		**Dr. A. R. Supale**
12:45 pm – 1:00 pm	*Studies on use of yttrium sulphide as the storage electrode in photoelectrochemical (pec) storage cell* **U.K. Mohite**		**Dr. T. R. Lohar and Dr. R. N. Deshmukh**
1:00 pm – 1:15 pm	*Statistical analysis of view of youth on our defense system* **Prakash R. Chavan and Deshmane J. Subahash**		
Break			
Session II			
2:00 pm - 2:30 pm	**Dr. Srinivas Kaveri** Director, CNRS Bureau in India, Embassy of France, New Delhi and Director of Research, INSERM, Sorbonne University, Paris, France	**Dr. G. V. Mali** Head, Department of Microbiology, Y. M. College, Pune	**Mrs. B. K. Bhavikatti**
2:30 pm - 3:30 pm	**Dr. Vivek Dham** Senior Advisor, Research and Innovation Section, European Union Delegation	**Dr. B.B. Ballal** Associate Professor, Department of Microbiology, Dr. Patangrao Kadam Mahavidyalaya, Sangli	
3:00 pm - 3:30 pm	Selected Poster Presentation		**Dr. S. T. Mane and Dr. M. J. Dhanavade**

Day Second, 22nd January, 2022			
Time	**Speaker**	**Chairperson**	**Member**
Inaugural Function			
11:00 pm – 11:30 pm	**Dr. A. D. Jadhav** Coordinator, Center of Excellence Incubation in Sericulture, Department of Zoology, Shivaji University, Kolhapur	**Dr. V. Y. Deshpande** Associate Professor, Department of Zoology Yashwantrao Chavan College of Science, Satara	**Dr. Mrs. P. M. Patil**
11:30 pm – 12:00 pm	**Dr. S. G. Dalvi** Scientist, Plant Tissue Culture, Vasantdada Sugar Institute, Manjari (BK), Pune	**Mrs. Dr. V. D. Jadhav (Rathod)** Professor and Head, Department of Botany, Shivaji University, Kolhapur	**Dr. V. B. Awale**
12:00 pm – 12:15 pm	*Giant African Snail - Achatina fulica (Bowdich, 1822), A Nursery Pest from Kolhapur District (M.S.)* **Mrunalini N. Desai and Suryakant V. Maske**		**Mr. H. V. Wangikar and Mr. N. G. Bahiram**
12:45 pm – 1:00 pm	*Study on Molecular specificity of D-Ala-D-Ser ligase enzyme of E. gallinarum: An Insilco approach* **Sneha B. Paymal, Shirishkumar V. Supanekar and Kailas D. Sonawane**		
12:30 pm – 02:00 pm	**Selected Poster Presentation**		
Session IV			
02:00 pm– 02:30 pm	**Dr. Habib M. Pathan** Associate Professor, Department of Physics, Savitribai Phule Pune University, Pune	**Dr. Jayavant L. Gunjakar** Ramanujan Fellow, D. Y. Patil Education Society Institution Deemed to be University, Kolhapur	**Dr. D. P. Nade**
02:30 pm – 02:45 pm	*Industrial approach of low cost thin film solar cell fabrication* **Sambhaji M. Pawar**		**Dr. V. S. Kumbhar and Mr. Y. C. Dhulgand**
02:45 pm – 03:00 pm	*Effect of Heavy Metal tolerant Plant Growth Promoting Rhizobacteria on Glycine max* **Sapana V. Velhal, Gajanan V. Mali.**		
Validatory			
03:00 pm – 03:30 pm	**Discussion and Feedback**		**Mrs. B. K. Bhavikatti**
03:00 pm – 03:30 pm	**Dr. Habib M. Pathan** Associate Professor, Department of Physics, Savitribai Phule Pune University, Pune	**President** **Dr. D. G. Kanase** Member of Management Council, Shivaji University, Kolhapur	
Note: Entire Zoom platform management for entire event: Mr. N. N. Natke and And Mr. M. P. Gavit			

INVITED TALK ABSTRACT

Chitosan: A Wonderful Molecule To Contribute Innovations By Biologists

S. G. Dalvi

Vasantdada Sugar Institute, Manjari (Bk) Pune- 412307

Corresponding address: sg.dalvi@ vsisugar.org.in

ABSTRACT

Chitin is an interesting polymer that occurs naturally in fungal cell walls and crustacean shells. Chitosan is deacetylated derivative of chitosan. Chitosan has garnered much interest due to its versatile properties and extensive applications in Chemical, Biomedical, Environmental, Agriculture industry as a functional material.

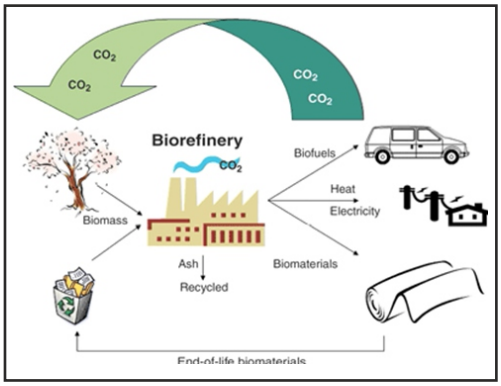
In agriculture chitosan and chitosan derivatives have shown wide applications in sustainable management of abiotic stresses viz. drought, high moisture, salt, heat, cold, heavy metals tolerance and tolerance to biotic stresses like fungal, bacterial, viral pathogens and insect pests. Due to its biocompatible, nontoxic, biodegradable, biofilm forming properties it is being exploited as better nano-carrier agent in development of smart fertilizers, pesticides, herbicides and plant growth promoters. It is also compatible with the beneficial microbes used in productions biofertilizers, biopesticides as it not only help their multiplication but also helps in enhancing their antimicrobial secretions.

At VSI, Pune Gamma irradiation technology has been utilized to obtain its low molecular weight derivatives as well as nanoparticles. Various nano-conjugates are also synthesized by grafting different active agents to increase its synergistic effect for mitigation of climate change by inducing multiple stress tolerance in crops. The ecofriendly one step technology was developed for deriving different nano-conjugates which used for not only enhancing the crop productivity significantly but also the quality of different agri-products. The Oligochitosan derivative was evaluated in field by conducting Multilocation field evaluation trials at different sugar mills in different agrocilmatic zones of Maharashtra and get recommended through JOINT-AGRESCO, the joint committee of all agriculture universities who recommends agri-input product for commercial use in agriculture. Different trials have indicated that application of irradiated chitosan enhances the sugarcane cane yield by 25-30 t/ha and the sugar production by 3.5. to 4 t/ha. It has also shown its utility in management of abiotic stresses like cold, salt, high temperature in sugarcane. It has been further observed that it help in reduction of pesticides by controlling different diseases and enhanced the productivity in vegetable crops like onion and potato, cabbage, cauliflower by 8-10 t/ha, in cereals and grain crops like jawar, bajara, wheat , rice etc enhanced productivity by 8-10 quintiles. In flower cop like marigold, chrysanthemum, jasmine, orchids, gerbera it has enhanced the flower productivity as well as quality and shelf life of flowers. In fruit crops like grapes, banana, pomegranate, mango, cashew it has shown very promising results for management of diseases and improving yield and quality. Thus this versatile application of the molecule is asset for biologists for exploring it further for novel applications in field of biology as there is vast scope as low molecular chitosan can be directly produced with different fungal species.

Introduction to Biomass Processing Technologies for the Production of Chemicals

By- Dr. Sanjeev P. Maradur, PPISR Bengaluru

ABSTRACT



During the pre-19th century, the biomass was the only source for the productions of energy and materials. After the petroleum revolution in the mid19th century, biomass was replaced by non-renewable sources, such as petroleum, which were cheap and widely available. Recently, the biomass is gaining interest for the production of chemicals and fuels which is mainly due to concerns of depletion of petroleum resources and environmental issues caused by the chemical and petrochemical industries. Recent policies of the government and interest in Academia, industry, is encouraging to promote the development of biomass conversion producing chemicals and fuels in a biorefinery.

Bioethanol is one of the versatile building blocks obtained through the fermentation route. It has a huge potential for the production of various commodity chemicals, such as ethylene, propylene, 1,3-butadiene and hydrocarbons, as well as for the production of higher oxygenated molecules, such as 1-butanol, ethyl acetate, acetaldehyde and acetic acid. From an Indian Context, we are one of the largest producers of sugar in the world. Ethanol which comes out as a byproduct of the sugar cane industry is gaining a lot importance in the recent past. The Indian government has made many policies recently to boost the ethanol blending and save the foreign exchange for import of crude oil. The Union Cabinet, chaired by the Prime Minister has approved National Policy on Biofuels – 2018 in May'18 which advocates to blend ethanol upto 10% in the transport fuels which will result in saving forex on import of crude and thereby will generate an additional revenue opportunity for the sugar industries.

In this talk, I shall be talking about the ethanol economy and will discuss briefly on the conversion of ethanol to commodity chemicals which will adds up the value addition to ethanol which otherwise is being used as a mere fuel blend and also our efforts/preliminary results in value addition of ethanol to couple of value-added products.

ORAL PRESENTATION INDEX

OP - 1	Production and characterization of biomass derived porous activated carbon for environmental applications	Amruta Koli, Akshata Pattanshetti, Rohant Dhabbe, Amit Supale, Sandip Sabale
OP - 2	Studies On Use Of Yttrium Sulphide As The Storage Electrode In Photoelectrochemical (PEC) Storage Cell	U. K. Mohite
OP - 3	Statistical analysis of view of youth on our defense system	Dr. Prakash Rajaram Chavan, Dr. Deshmane Jini Subahash
OP - 4	Giant African Snail - Achatina fulica (Bowdich, 1822), A Nursery Pest From Kolhapur District (M.S.)	Mrunalini N. Desai and Suryakant V. Maske
OP - 5	Study on Molecular specificity of D-Ala-D-Ser ligase enzyme of E. gallinarum: An Insilco approach	Sneha B. Paymal, Shirishkumar V. Supanekar & Kailas D. Sonawane
OP - 6	Industrial approach of low cost thin film solar cell fabrication	Sambhaji M. Pawar
OP - 7	Effect of Heavy Metal tolerant Plant Growth Promoting Rhizobacteria on Glycine max	Miss. Sapana Vishwas Velhal, Dr. Gajanan V. Mali.

ORAL PRESENTATION ABSTRACT

1. Production and characterization of biomass derived porous activated carbon for environmental applications

Amruta Koli[1], Akshata Pattanshetti[1], Rohant Dhabbe[1], Amit Supale[2], Sandip Sabale[1*]

[1] Department of Chemistry, Jaysingpur College, Jaysingpur-416101, Maharashtra, India
[2] Department of Chemistry, Dr. Patangrao Kadam Mahavidhyalaya, Sangli-416416, Maharashtra, India

E-mail: amrutakoli7@gmail.com (AK); srsabale@gmail.com (SS)

ABSTRACT

Wheat bran (WB) was used as a carbon precursor for the production of hierarchically porous activated carbon (HPAC) via nitrogen activation for CO_2 capture and dye adsorption. The carbonized WB contains particles along with volatile matter distributed on its surface, after activation, the pore structure was developed by forming micropores and mesopores. The HPAC were chemically, texturally and structurally characterized; BET model was used to explicate the pore formation, which display increasing SSA of HPAC (728.44 m^2/g) and pore volume (0.26 cm^3/g) beneficial to the development of pore structure and enhancement in adsorption capacity. The HPAC attractively capture CO_2 with highest sequestration of carbon dioxide 2.47 mmol/g at 1 bar and effective adsorbent for fast removal of methyl orange dye with maximum adsorption capacity of ~555.09 mg/g.

Keywords: Activated carbon, N_2 activation, Porosity, Environmental Application

2. STUDIES ON USE OF YTTRIUM SULPHIDE AS THE STORAGE ELECTRODE IN PHOTOELECTROCHEMICAL (PEC) STORAGE CELL

U.K. Mohite

Department of Physics, M.B.S.K. Kanya Mahavidyalaya, Kadegaon,
Dist.- Sangli-415304(M.S.)

E-mail: mohiteuk111@gmail.com, Mob.: 9225803280.

ABSTRACT

The study of yttrium sulphide as storage electrode was carried out by designing a special three electrode storage cell system. It consists of three electrodes, namely, storage electrode, photoelectrode and counter electrode. Electrodeposited yttrium sulphide film and CdSe film on to a stainless steel substrate has been used as a storage electrode and photoelectrode respectively. The graphite rod was used as a counterelectrode. These three electrodes were immersed in two rectangular transparent plastic boxes containing suitable electrolytes. Boxes were bridged together by agar-agar gel. The cell was illuminated by a high intensity lamp. The electrical characteristics in the mode of charging and discharging were studied.

Keywords: Storage cell, storage electrode, photoelectrode, counterelectrode and agar-agar gel.

3. Statistical analysis of view of youth on our defense system

Dr. Prakash Rajaram Chavan [1], Dr. Deshmane Jini Subahash [2]

[1]Head & Assistant Professor, Department of Statistics
[2]Assistant Professor, Department of Zoology
Smt. Kasturbai Walchand College, Sangli,
Affiliated to Shivaji University, Kolhapur, (Maharashtra), India

E-mail: prchava83@gmail.com, E-mail: prchava83@gmail.com

ABSTRACT

Defense of a country has always been a topic of interest. It clearly associates with the potential of the country to protect its citizens. India is known to possess the best amongst the best and most courageous armed officers who put their lives in constant danger for protecting the country. The rigorous training and extremely disciplined life is what makes them so. No wonder, defense services are one of the most important as well as prestigious services of a country and hence require the supreme most and eminent officers. Our aim was to make a statistical analysis on the Indian Defense system, its prevailing scenario and the awareness among youth about it. We wanted to check the opinion of the youth of our country about defense as a career, their awareness about the hardships of military people, their views in Governments' interference in the decisions related to defense etc.

Key words: Statistical Analysis, Defense, Youth, Awareness.

4 . Giant African Snail - Achatina fulica (Bowdich, 1822), A Nursery Pest From Kolhapur District (M.S.)

Mrunalini N. Desai[1] and Suryakant V. Maske[2]

[1] Department of Botany, Dr. Tanajirao Chorage College, Nandwal, District Kolhapur-
[2] Department of Zoology, Shri Vijaysinha Yadav College, PethVadgaon, Kolhapur-416112

E-mail: drsuryakant27vymp@gmail.com

ABSTRACT

Achatina fulica is invasive terrestrial snail can cause serious economic damage to different agricultural crops as well as nursery and garden plants. The extensive rasping, defoliation, slime trails, or ribbon like excrement is signs of infestation. The study was carried out in different nurseries from Kolhapur district. In recent times, severe outbreak of this pest has been noticed due to some desirable agricultural and gardening practices like minimum tillage practices and straw retention techniques which help in survival of snails and make seedlings more susceptible to damage. Present investigation aims to enlighten on taxonomy, appearance, behavior and habitat, dispersal, diet, reproduction pattern, nature of damage and to suggest management strategies.

Key Words: Giant African Snail, *Achatina fulica*, Nursery plants, Management practices.

5. Study on Molecular specificity of D-Ala-D-Ser ligase enzyme of *E. gallinarum:* An Insilco approach

Sneha B. Paymal[1, 2, 3], Shirishkumar V. Supanekar[1] & Kailas D. Sonawane[2, 3]

[1] Rayat Institute of Research and Development, Satara, MS, India
[2] Department of Microbiology, Shivaji University, Kolhapur, MS, India
[3] Structural Bioinformatics Unit, Department of Biochemistry, Shivaji University, Kolhapur

E-mail: snehapaymal96@gmail.com

ABSTRACT

Antimicrobial resistance (AMR) threatens the global public health worldwide, effective treatment require for the treatment, spread and prevention of antibiotic resistance bacteria for control of infectious diseases. Until the late 1980s, the glycopeptide antibiotic vancomycin was considered the drug of last resort for treatment of disease caused by Gram-positive bacteria. Resistance to glycopeptide is due to the production of low-affinity pentapeptide precursors ending in either D-lac or D-ser and the elimination of the normally produced high-affinity precursors (D-Ala-D-Ala). DD-ligase is an essential bacterial enzyme involved in peptidoglycan biosynthesis. It catalyzes the synthesis of D-ala-D-ala and D-ala-D-ser dipeptide or D-ala-D-lac depsipeptide. These enzymes are of particular interest as they use substrates D-amino acids that are specific to bacteria and essential for bacterial growth. DD-ligase therefore represents a viable antimicrobial target. Hence, present study aims at prediction of three-dimensional structure of VanC enzyme, whose structure is not available and finding of scaffold for lead molecule development. The 3D structure of DD-ligase was predicted by homology modelling technique. Further the structure was validated by analysis of Ramachandran plot. Molecular specificity of DD-ligase was studied by molecular docking using AutoDock 4.0 software. The docking analysis shows that residues Asp234, Glu14, His96, Arg315, and Glu14 involve in binding of substrate at its specific site. Based on the analysis it will be possible to screen drug candidate that interact with this residues to inhibit DD-ligase activity. Thus, this study will be helpful in development of novel antimicrobial compound.

Keywords: DD-ligase, Homology modelling, Molecular specificity, Molecular docking.

6. Industrial approach of low cost thin film solar cell fabrication

Sambhaji M. Pawar*

Advanced Energy Materials Laboratory, Department of Physics,
Sanjay Ghodawat University,
Kolhapur (MS) - 416 118, India

E-mail: sambhaji.pawar@sanjayghodawatuniversity.ac.in, spawar81@gmail.com

ABSTRACT

Earth-abundant and environmentally benign kesterite Cu_2ZnSnS_4 (CZTS) based absorber is a promising alternative to its cousin chalcopyrite $Cu(In,Ga)(S,Se)_2$ (CIGS) for photovoltaic applications. The CZTS based absorber layers were deposited onto Mo-coated coated glass substrates by using physical and chemical method followed by annealing in sulfur and selenium atmosphere. Subsequently, they were applied to the fabrication of thin film solar cells. Upon annealing, the amorphous nature of as-deposited precursor film changes into polycrystalline kesterite crystal structure with uniform and densely packed surface morphology. Energy dispersive X-ray spectroscopy (EDS) study reveals that the deposited thin films are nearly stoichiometric. The solar cell fabricated with CZTS based absorber layer, showed the best conversion efficiencies of (η) 7 % and 1.21% for 0.44 cm^2.

Keywords: Electrodeposition, Cu_2ZnSnS_4 thin films, annealing atmosphere, thin film solar cell

7. Effect of Heavy Metal tolerant Plant Growth Promoting Rhizobacteria on *Glycine max*

Miss. Sapana Vishwas Velhal[1], Dr. Gajanan V. Mali[2]

Rayat Institute of Research and Development, Satara [1],
Yashwantrao Mohite College, Pune [2].

E-mail: sapanavelhal.sv@gmail.com

ABSTRACT

Contamination of the environment by heavy metals is wide spread problem due to their use in various industries and agriculture processes. There are different heavy metals which affects negatively on the plant growth. Heavy metals are harmful to the all living organisms and they accumulate in edible plant parts. Various heavy metals like Zn, Cd, Cu, Pb, etc. are highly solubilized in water that leads to enter into plants quite easily and accumulate into it. They causes decreasing seed germination, photosynthesis and transpiration. They also causes adverse effects on soil, physical and chemical properties of soil and also fertility of soil. On the onset of this soil pollution, various chemical methods are used for removal and neutralized the toxic effect of different heavy metals but these methods are costly and shows some side effects. Various microorganisms especially plant growth promoting rhizobacteria (PGPR) are used to prevent toxic effect of heavy metals. Bacteria that colonize the plant root region and promote the plant growth such bacteria are called plant growth promoting rhizobacteria (PGPR). This plant growth promoting rhizobacteria have ability to naturally neutralize such toxicity. Inoculation of crop plants with these plant growth promoting rhizobacteria can helps to improve the growth and productivity under normal as well as heavy metals stressed conditions. This abstract shows, the inoculum of plant growth promoting rhizobacteria (PGPR) are used against to neutralized heavy metal stressed condition. Also this PGPR are used in the process of bioremediation to neutralize the toxicity of heavy metals. Heavy metal tolerance rhizobacteria are used as recent tools to increase the growth and productivity of crop plants under the heavy metal stress conditions.

Key words: Industrialization, heavy metal tolerance, PGPR, Bioremediation.

Index of Poster Presentation Abstracts

Sr. No.	Title of Paper	Authors
PP-13	Microwave Assisted and VB_1 Catalyzed Cyclocondensation Reaction for the Synthesis of 4(3*H*)-Quinazolinones	Omprakash B. Pawar
PP-14	Exploring antimicrobial compound producing bacteria from soil sample analysis of *Crozophora plicata* (Vahl)	Priyanka S. Dhotare, Nasir R. Shaikh and Kailas D. Sonawane
PP-15	A review on synthesis and evaluation of new Benzimidazole derivatives as potential antimicrobial agents	Mr. B. V. Pathare
PP-16	Chemical Synthesis And Characterization Of Lanthanum Substituted Mg –Zn Ferrite	Ramesh A. Bugad and Bharat G. Pawar
PP-17	Application of Various Vegetation Indices to Extract Litchi Cultivation Area – A Case Study of Muzaffarpur District, Bihar, India.	Bhartendu Sajan
PP-18	Ag thick film microstrip straight resonator as a moisture sensor for biomaterial	Vaishali Mane, Swati Patil, Vijaya Puri
PP-19	Effect of Plant Growth Promoting Rhizobacteria on Secondary Metabolites of Medicinal Plant	Ruddhi R. Jagtap, Gajanan V. Mali, Kailas D. Sonawane
PP-20	One-pot, three-component reaction for efficient synthesis of 4H-isoxazole-5-ones using ZnO nanoparticles as green catalyst	Sanjay S. Ghevadea, Santosh B. Kambleb, Kiran N. Patila
PP-21	A simple and an efficient one pot synthesis of Hantzsch 1,4-dihydropyridines using 5-sulphosalicyclic acid (5- SSA) as an organocatalyst	Kiran N. Patil, Tejas S. Ambi, Rohan B. Dalavi, Vinayak B. Gaykwad, Shubham A. Kavale
PP-22	Diversity of marginal plants of some water bodies in Gadhinglaj Tahsil and their ecological significance.	Sawant R. S, Patil A. P, Patel J. S. and Patil S. M.
PP-23	Brine shrimp lethality assay of leaves of *Bauhinia acuminate* Linn.	Mohsin J. Jamadar, Preeti Khuble and Shrinivas Mohite
PP-24	Review of Ethnofloristic diversity of Kharepatan village in Kankavali tehsil of Sindhudurg District, Maharashtra.	Prajyot S. Nalawade, Sharmin H. Kazi, Mangal A. Parab, Ruchi N. Teli, Kavita P. Amkar and Pratik D. Natekar

Sr. No.	Title of Paper	Authors
PP-25	Optimization of Synthesis parameters for CNTs Using Olive Oil	Gaud Brijesh, Singh Amrita, Kshirsagar Datta and Jaybhaye Sandesh
PP-26	Crop Mapping Using Multiple Sensors With Machine Learning Method On Gee Platform	Priyanka Gupta, Dr. Varun Narayan Mishra
PP-27	Phytochemical and antibacterial study of rhizome and leaf extract of *Cryptocoryne cognata* Schott	Inamdar F.R., Wadkar S.S., Gurav R.V.,
PP-28	Estimation of Phytoconstituents, Soil characterization and isolation of Arbuscular Mycorrhizal fungi from *Curcuma longa* L.	R. S. Nikam, N. B. Mane
PP-29	The role of biofilm forming bacteria as bio-fertilizer and biocontrol agent against *Ralstonia solanacearum*	Trupti K. Gade, Shirishkumar V. Supanekar, Kailas D. Sonawane
PP-30	Liquid assisted grinding as environmentally benign protocol for synthesis of 6-amino-3-methyl-4-phenyl-1,4-dihydropyrano[2,3-*c*]pyrazole-5-carbonitrile derivatives as cystinyl amino peptidase inhibitors and antihypertensive agents	P. R. Kharade, U. B. Chougale and S. R. Dhongade
PP-31	Design, Synthesis, Characterization And Biological Evaluation Of Some New Aryl-Pyrazole Based Chalcones As Anticancer Agents	U. B. Chougale, P. R. Kharade, H. V. Chavan, S. M. Deshmukh, K. N. Patil and S. R. Dhongade
PP-32	Antiviral Potential of Medicinal Plants – Influential Immunity Boosters for the Pandemic of Covid-19	Dr. Anjali P. Patil
PP-33	OXIDATION OF BENZ AND *m*-TOLUIC ACID HYDRAZIDES BY THALLIUM(III) IN ACIDIC MEDIUM	A. S. Varale
PP-34	Phytochemical Evaluation of Ethanolic and Ethyl acetate extracts of *Cyamopsis tetragonoloba* (L). Taub	Salma Akbar Bagwan and Nilofar S. Naikwade
PP-35	Occurrence of Arbuscular Mycorrhizal Fungi and qualitative analysis of *Crozophora plicata* (Vahl)	T. S. Khandagale, N. B. Mane
PP-36	Stress Survey of Students to understand the major stressors during the period of Covid -19 Pandemic lockdown .	Dr. Sheetal B. Juneja (Banerjee)

Sr. No.	Title of Paper	Authors
PP-37	Extract of Pomegranate Peels (EPP): a Bio-Waste Heterogeneous Catalyst for Sustainable Synthesis of Biscumarin Derivatives	Appasaheb T. Birajdar
PP-38	Facile Fabrication Of Durable Candle Soot - Wax Composite Coated Superhydrophobic Stainless Steel Mesh For Oil-Water Separation Application	Mehejbin R. Mujawar, Rajesh B. Sawant, Deepak A. Kumbhar, Krishna K. Rangar, Govind D. Salunke, Sanjay S. Latthe, Suresh S. Patil and Shivaji R. Kulal
PP-39	Variability of UV Irradiance measured by MICROTOPS II at Kolhapur station.	Akshay S. Patil , Rani Pawar, Sanket Mali, Dada P. Nade
PP-40	Quality by Design (QbD) approach: Estimation of related impurities of Elagolix sodium drug	Shrikant Babar, Amit Supal, Rohant Dhabbe, Sandip Sabale
PP-41	Estimation of Ground Water Quality of Sangli-Miraj-Kupwad Industrial Area	Powar S. K.
PP-42	Effects of Sulphate and Salt Sources on the growth of *Alternaria alternata* causing *Alternaria* blight of Chickpea.	S. N. Inamdar and M. B. Waghmare
PP-43	Physico-chemical analysis of soils from crop fields in Baramati Tehsil Dist. Pune, Maharashtra, India.	Torane S. N., Shete R. S., Chavan S. J., Mali B. S.
PP-44	D.C. conductivity studies of lithium chromium ferrite	S. N. Kulkarni, R. A. Shaikh, B. K. Chougule, J. R. Nagarale
PP-45	Plant extract mediated Synthesis of silver polypyrrole nanocomposite for photo catalytic applications	Sachin A Khade, Sunil Nirmale, Akshay Gurav
PP-46	Bioactive constituents, antioxidant activities and in vitro propagation of unexplored medicinal plant	Shreedhar S. Otari, Suraj B. Patel, Savaliram G. Ghane
PP-47	Properties of Tin Oxides thin film by Vacuum Evaporation Method	Shital P. Patil[2, *], Sarika P. Patil[2], V. R. Puri[1]
PP-48	Purification and partial Characterization of Antimicrobial peptide from Bacteria.	Vikramsinh B. More, Kailas D. Sonawane*
PP-49	New Species of Genus Argina (Lepidoptera: Arctiidae) from Western Ghats of Maharashtra	Vishnu Y. Kadam[1], Rajendra V. Salunkhe[2*] and Sanjay K. Gaikwad[3]

Sr. No.	Title of Paper	Authors
PP-50	Significant roles of ground based remote sensing phased array Doppler SODAR in the study of atmospheric boundary layer dynamics	T.Y. Landage[1], D.P. Nade[2], R.P. Pawar[1]
PP-51	Investigation on electrical properties of CuO-NiO-GDC anode in biogas for ITSOFCs	Sarika P. Patil[1,2*], Shital P. Patil[1], L. D. Jadhav[2]
PP-52	Synthesis and characterization of Dysprosium Selenide (Dy_2Se_3) thin films by using simple successive ionic layer adsorption and reaction SILAR method	S. D. Khot[1], D. B. Malavekar[1], R. P. Nikam[1], S. B. Ubale[1], P. P. Bagwade[1], C. D. Lokhande[1]*
PP-53	Chemical synthesis of CuO nanostructures for electrochemical supercapacitor	Rutuja Gurav[12], Balaji Salokhe[2], Suhasini Yadhav[2], Kishor Gurav[2], Sarita Patil[1]
PP-54	Bismuth Chromate (Bi_2CrO_6): A Promising Semiconductor Photocatalyst under Natural Solar Radiation	Ruth Madhale[a], Deepali Shinde[b], Sangram Salve[a], D. S. Bhange[b] and Pallavi Bhange[a]
PP-55	Effect of Boron and fluorine doping on ZnO Thin films	S. C. Yadav[1], M. D. Uplane[2]
PP-56	Change in structural and dielectric properties of $cofe_2o_4$ ferrite due to sm doping	Aditi Yadav[1], Rutuja Patil[1,], C.M. Kanamadi[2]*, and Sarita Patil[1]*
PP-57	Histological observation on the Fifth instar larval testis of tasar silkworm Antheraea proylei J.	Varsha Kumbhar
PP-58	Biodiversity of Diatoms from Wai Tahasil, Satara district (Maharashtra).	Manjusha Ingawale
PP-59	Plants as a biological indicator of air pollution in corporation areas of Sangli, Miraj and Kupwad. (Maharashtra)	Vikas Awale, Harshal Wangikar and Mangesh Gavit

Abstracts

1. Phytoallelopathic effect of different concentration of *Vitex negundo* L leaf leachates on germination and growth of *Trigonella foenum-graecum* L c.v. Lam selection-1 and *Eleusine coracana* (L). c.v. Dapoli

Dr. VIKRAM P. MASAL

P.G.Research Lab. Dapoli Urban Bank Senior Science College Dapoli.
Dist: Ratnagiri. (M.S.) 415 712

E-mail: masalvikram@gmail.com

ABSTRACT

It is now very well realized that the presence of neighboring plants species can have a significant influence on seed germination growth and yield of crop plant (Rice, 1974). The influence may be either positive or negative depending upon the nature of allelochemical released by the allelopathic plants such allelopathic effect will become more prominent to future agricultural systems because of decrease in farm size, intercropping and crop rotation and introduction of agro forestry. Hence it was though worthwhile to investigate influence of some common prominent plant species which have entered in the agriculture of konkan region, on the seed of germination and growth of seedling.

In the present investigation deals with the study of significant Phytoallelopathic effect of different concentration of *Vitex negundo* L leaf leachates on germination and growth of *Trigonella foenum-graecum* L c.v. Lam selection-1 and *Eleusine coracana* (L). c.v. Dapoli – 1.During the experimental period Environmental temperature of Konkan region ranging from 12.02^0c to 34.87^0c and humidity 62% to 93.9%.

Key Words: Allelopathy, *Vitex negundo* L., *Trigonella foenum-graecum* L c.v. Lam selection-1 and *Eleusine coracana* (L). c.v. Dapoli - 1., Konkan

2. Occurrence of Arbuscular Mycorrhizal Fungi and qualitative analysis of *Crozophora plicata* (Vahl)

T. S. Khandagale, N. B. Mane

Department of Botany, Yashavantrao Chavan Institute of Science, Satara (Autonomous)
Shivaji University, Kolhapur

Corresponding author: nbmane123@gmail.com, tkhandagale98@gmail.com

ABSTRACT

The *Crozophora plicata* (Vahl) belongs to family euphorbiaceae from drought prone area Wathar station in Satara District were investigated for occurrence of arbuscular mycorrhizal fungal association. Collect the test plant and screened for qualitative determination and occurrence of (AM) fungi. The result were reported from rhizopsphere soil of test plant are two genera, Aculospora and Glomus. Glomus ((7) are maximum than Acaulospra (1). Qualitative analysis was carried out from fruit and leaf of selected plant. Carbohydrate, Phenol, Saponin, Flavonoid, were found more while Alkaloid, Tannin and Glycosides were recorded less.

Keywords: Arbuscular Mycorrhiza, *Crozophora plicata, Glomus, Acaulaspora,*

3. Preliminary Phytochemical Screening and HPTLC Fingerprinting of Leaves extracts of *Convolvulus pluricaulis*

Ashpak M. Tamboli*, Kiran A. Wadkar

[1]Assistant Professor, Department of Pharmaceutical Chemistry,
Sahyadri College of Pharmacy, Methwade, Sangola
Professor & HOD of Pharmacognosy, Appasaheb Birnale College of Pharmacy, Sangli. [2]

Presenting author mail: [1]ashpak.tamboli@gmail.com

ABSTRACT

Objective: To establish the fingerprint profile of *Convolvulus pluricaulis* leaves using high performance thin layer chromatography (HPTLC) technique.

Methods: Preliminary phytochemical screening was done and HPTLC studies were carried out. CAMAG HPTLC system equipped with Linomat V applicator, TLC scanner, and WINCATS-1.4.2 software were used.

Results: The preliminary qualitative phytochemical analysis made for the leaves reveals the presence of Alkaloids, Glycosides, Flavonoids, Carbohydrates, Sterols, and Saponins.
HPTLC finger printing of ethanolic extract of leaves of *Convolvulus pluricaulis* revealed 5 peaks with Rf values 0.01, 0.07,0.26, 0.65, 0.86.

Conclusions: It can be concluded that Preliminary phytochemical screening of various extracts revealed the presence of different primary and secondary metabolites. HPTLC fingerprint analysis of ethanolic extract of leaves of *Convolvulus pluricaulis* can be used as a diagnostic tool for the correct identification of active phytoconstituents present in leaves of *Convolvulus pluricaulis*. Future study aims at identification and isolation of active phytoconstituents responsible for pharmacological activity.

Keywords: *Convolvulus pluricaulis* leaves, Phytochemical Screening, HPTLC Fingerprinting

4. Screening of *Simarouba glauca* bioactive extract for cytotoxicity potential and inhibition studies on cancer cell lines

Chirag U. Narayankar1, Manasi S. Patil1, Nivas M. Desai*,
Sudarshan T. Charapale1, Indrajeet A.Samat2, D. K. Gaikwad3

ABSTRACT

The ethanolic extract of Simarouba glauca was studied for anticancer potential against human stomach cancer cell line (AGS). The cytotoxicity of ethanolic extract was analyzed, using MTT assay and flow cytometric analysis. It was noticed that IC50 value of Simarouba glauca bark crude extract against AGS cell line was 61.16 µl/ml by using MTT assay. The flow cytometry evaluation exhibits cell arrested in G0/G1 and S phase. Cell arrested due to Simarouba galuca. Thus Simarouba galuca bark and leaves extract might be used as potent source of anticancerous against human breast and stomach cancer.

5. Fungi of Order Polyporales From Satara District (M.S.)

K.N Gurav* & V.P.Patil

Department of Botany and Plant Protection Sadguru Gadage Maharaj College, Karad.

Presenting author mail: kumod444@gmail.com

ABSTRACT

Order Polyporales includes 18 family which belongs to *Class Agaricomycetes* recorded about 109 genera and 1672 species all over world. Polyporales are characterized by annual or perennial in habit, the basidiocarp is variable in size, texture, color and test. These polypores are recognized in different types of hymenium like resupinate, effused-reflexed & pileated. Abhymenium shows smooth or worted, zonate or azonate, glabrous to tomentose to sulcate like characters. Hymenophores shows diversity instead of porioid to angular to elongated to irregular to daedaleoid or lamellate pores.

Satara is a district in the Maharashtra shows diversity of mycobiota.Total 10 species were identified these are *Daedalea quercina, Flavadon flavus, Ganoderma applanatum ,Ganoderma australe, Ganoderma lucidium, Ganoderma resinaceum, Ganoderma sessile, Hexagonia tenuis, Picipes badius and Tramates betulina.*

Keywords: *Polyporales, Agaricomycetes*, *effused-reflexed, Satara, mycobiota.*

6. Use of Colors in Pharmaceutical Preparations

Patil Mohini

Dr. Shivajirao kadam college of Pharmacy,
Kasbe-Digraj

E-mail: patilmohini0318@gmail.com

ABSTRACT

The worldwide demand for natural dyes is nowadays of great interest due to the increased awareness on therapeutic properties of natural dyes in public. Colorants are mainly used to impart appearance to the pharmaceutical dosage forms. There are many types of pharmaceutical preparations which need to be coloured such as tablets, tablets coatings, capsules (hard gelatin, soft gelatin), liquid orals, tooth pastes, ointments and salves. Colouring may be required to increase the aesthetic appearance or to prolong the stability or to produce standard preparations or for identification of a particular formulation. Now a day's worldwide demand for natural dyes has increased due to the awareness and beneficial properties of natural dyes. The medicinal plants are widely used for curing various types of diseases. The present review, describes the information regarding the use of natural colorants used in medicinal formulations.

Keywords: Natural dyes, therapeutic properties, Medicinal formulation, Pharmaceutical preparation, Medicinal plant.

7. Synthesis of Nano porous Carbon fibres (CFs) form plant Waste and its Analysis

Sandip V. Wakchaure, Vilas R. Khairnar

Department of Chemistry, Birla College Kalyan, Thane (M.S.) Ind.

E-mail: khairnar.vilas@gmail.com

ABSTRACT

We report here simple method of preparation of nano porous Carbon fibres (CFs) by thermal decomposition. Thermal decomposition of waste plant material was carried out in CVD. Scanning electron microscope (SEM) image revels that the Carbon fibres (CFs) formed around 200 ~ 500 nm in width. For the synthesis of Carbon fibres (CFs) synthesis raw fibres is important step, for that naturally dried waste plant material is wash with distilled water and soak in 20% NAOH solution for three days for the complete removal of alkaline material. These raw fibres then wash properly with distilled water and dried in oven at 120^{o}C. Synthesis of carbon fibres (CFs) was carried out by using CVD method at 850^{0}C. Hydrogen gas was used as carrier gas. The morphological structural properties of Carbon fibres (CFs) were investigated by scanning electron microscopy (SEM), EDX, XRD, BET. The synthesized Carbon fibres (CFs) have a crystalline size of 200~ 500 nm. Carbon fibres (CFs) shows porous nature wall size of pores in the range of 10~20 nm and inner diameter of pore is in the range of 20~50 nm seen by the SEM images. The crystalline nature of fibres is observed with help of XRD. BET study shows that Carbon fibres (CFs) have high surface area around 242.56 Sq.m/gm. Synthesised Carbon fibres (CFs) can be used in different fields like electrochemical sensors supercapacitors, fuel cell etc.

Key words: Carbon fibres (CFs), CVD, NAOH, BET, Hydrogen Gas

8. Studies of Arbuscular Mycorrhizal Fungi, Soil characterization and qualitative estimation of *Acacia concinna*

G.S. Patil, N.B. Mane

Department of Botany, Yashavantrao Chavan Institute of Science, Satara (Autonomous)
Shivaji University, Kolhapur

Corresponding author: nbmane123@gmail.com, patilgauri@gmail.com

ABSTRACT

The *Acacia concinna* is an evergreen thorny shrub grows upto 10-20 m cultivated in Botanical garden of Yashvantrao Chavan Institute of Science, Satara Maharashtra State. In the present investigation status of Arbuscular Mycorrhizal fungi, soil characters and qualitative estimation of *Acacia concinna* were taken for study. Collect the test plant and screened for qualitative determination and rhizosphere soil for determination of AM fungi. The Data presented here demonstrate that rhizopsphere soil of test plant is found two genera; Aculospora with more and Glomus are dominant. Qualitative analysis with methanol extract of leaf was reported Carbohydrate, Phenol, Saponin and glycosides, were recorded maximum while Alkaloid, Flavonoides Tannin, were found minimum. Our findings evidence that crude aqueous extract contain medicinally important bioactive compounds and it justifies their use in the traditional medicines for treatment different diseases.

Keywords: Arbuscular Mycorrhiza, *Acacia concinna, Glomus, Acaulaspora*

9. Q- Vague Ideals and Q-Vague R-Subgroups in near-ring

Miss Pritam Vijaysigh Patil[1]

1. Shivaji University, Kolhapur[1]
2. Sanjay Ghodawat University, Kolhapur[1]

E-mail: pritamvijaysighpatil@gmail.com

ABSTRACT

In this paper the author study the concepts of Q -Vague sub near-rings, Q-Vague ideals in near-ring and Q-Vague R-Subgroups in near-ring R. Some properties are illustrated corresponding to of Q -Vague sub near-rings, Q-Vague ideals in near-ring and Q-Vague R-Subgroups in near-ring R.

Key Words: Vague Ideals, Vague R-Subgroups, Near-ring, Q-Vague sets.

10. A Review Article Based on Composite Graphene @ Tungsten Oxide Thin Films for Various Application

Ayesha Khan[a], B.Nilam[b], Amar Jadhav, Anamika Kadam[a]*

[a] The Institute of Science, Dr. Homi Bhabha State University, 15, Madam Cama Road, Fort, Mumbai–400032, India.
[b] Indian Institute of geomagnetism, Mumbai Headquarter (Panvel Campus) Plot 5, Sector 18, Near Kalamboli Highway New Panvel Navi Mumbai, 410218, India.

*Corresponding Address: Dr. Anamika V. Kadam, Email: anamikasonavane@rediff.com, anamika@iscm.ac.in

ABSTRACT

Graphene and its derivatives are the hot topics of research during this decade due to their excellent thermal conductivities, mechanical strength, current densities, electron mobilities, and large surface area. On the other hand, Tungsten trioxides are direct bandgap semiconductors with excellent optical, electrical and structural properties. Pairing graphene and its derivatives with tungsten oxide (WO_3) to create heterojunction could be an exceptionally promising tool to achieve improved effectiveness in photocatalysis, energy storage, medical, electrochromism, and energy conversion. In addition,due to their well-matched band edge positions, efficient charge separation, and light-harvesting abilities, composite exhibit significantly higher efficiency than either individual material. In this review, the noteworthy endeavors and exceptional turning points accomplished utilizing WO_3 and derivatives of graphene's heterojunction for different applications. Conclusively, the scope of future research work to design the heterojunction with high efficiency utilizing WO_3 and graphene is explored.

Keywords: tungsten oxide, reduced graphene oxide, composite, photocatalytic, gas sensor, electrochromism.

11. *Chalybion bengalense* (Dahlbom) the mud dauber wasp (Hymenoptera, Sphecidae) act as a bio pest control

Chanchal R. Deshmukh

Assistant professor Department of Zoology Taywade College, Koradi

E-mail: chanchaldeshmukh@gmail.com

ABSTRACT

Chalybion bengalense (Dahlbom) the Blue mud dauber wasp belong to family Sphecidae which is widely distributed throughout the world. The female wasp selects pre existing holes and nest of various eumenids, Sphecidae also for lay eggs. The adult feed on nectar and plant juice but the larva feed on spiders. In present study we found that Female wasp choice the nest of Delta pyriforme pyriforme, Delta dimidiatipenne, Oreumenoides edwardsii , Delta esuriens, *Delta conoideum,* Xenorhynchium nitidulum, *Sceliphron madraspatanum* . Female wasp cleans the nest and remove the previous larva the nest stuff with paralyzed spiders and lay egg on it after that the nest was sell by mud and lime . That's how the Chalybion bengalense control the population of spiders and other wasp species.

Key words- Blue Mud dauber, Sphecidae, Bio pest Control

12. STUDIES ON PHYTOCHEMICAL CONSTITUENTS OF TWO SELECTED SPECIES OF ANISOMELES R.Br GROWING IN WESTERN GHATS.

S. S. Khot[1], S. B. Fasale1, M.B. Waghmare[2]

2 Department of Botany, The New College, Kolhapur 416012 (M.S.) India
1 Department of Botany, Yashwantrao Chavan Warana Mahavidyalaya, Warananagar, Kolhapur- 416 113 (M.S.) India

E-mail: shriram.fasale@gmail.com

ABSTRACT

The current study was made endeavor to analyze phytochemical constituents of Anisomeles indica and Anisomeles heyneana. Most members within family Lamiaceae comprises peculiar aroma due to secondary metabolites. The species are used to treat various diseases. The Anisomeles is one of the important members of Lamiaceae which is used to cure skin diseases, abdominal pain, psoriasis, anti-cancerous, anti-microbial and anti-bacterial. During present investigations chemical, extract of dried leaf and stem was made in two different solvents as, distilled water and methanol showed present of flavonoids, alkaloids, tannins, saponin, phenolics and terpenoids.

Keywords: Anisomeles, Lamiaceae, Phytochemical.

13. Microwave Assisted and VB_1 Catalyzed Cyclocondensation Reaction for the Synthesis of 4(3*H*)-Quinazolinones

Omprakash B. Pawar

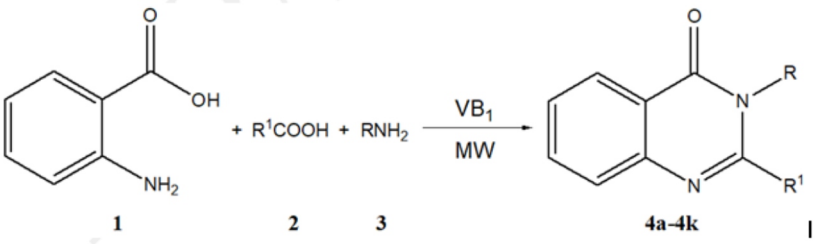
Department of Forensic Chemistry, Government Institute of Forensic Science
Aurangabad – 431 004, MH, India.

E-mail: obpawar@gmail.com

ABSTRACT

Recently much attention has been devoted towards 4(3*H*)-quinazolinones derivatives due to their significant therapeutic and medicinal properties such as anti-inflammatory,[1] anti-convulsant,[2] anti-hypertensive[3] and antimalarial activities.[4] Because of its interesting properties, such as non-toxic, inexpensive, stable, eco-friendly and metal ion free thiamine hydrochloride is considered to be a special catalyst for promotion of organic reactions.[5-6]

An efficient method for one-pot rapid synthesis of 4(3*H*)-quinazolinones derivatives by the multi-component condensation of anthranilic acid, primary aromatic amine and carboxylic acid in the presence of VB_1 as catalyst under solvent-free condition. The remarkable advantages offered by this method are higher yields, easy synthetic procedure, and use of easily available, inexpensive and biodegradable catalyst.



Keywords: 4(3*H*)-quinazolinones, microwave assisted reactions, solvent free.

14. Exploring antimicrobial compound producing bacteria from soil sample

Priyanka S. Dhotare[1], Nasir R. Shaikh[2] and Kailas D. Sonawane[1]

Department of Microbiology, Shivaji University Kolhapur1,
Yashwantrao Chavan College of Science, Karad2.

E-mail: psd.rs.microbio@unishivaji.ac.in, nrsshaikh@gmail.com,
kds_biochem@unishivaji.ac.in

ABSTRACT

The aim of this study is to check antimicrobial activity of the antimicrobial compound producing bacteria. For this purpose, 28 different strains producing antimicrobial compound were screened from soil sample of different agricultural areas using crowded plate technique. Morphological, biochemical and colony characteristics were performed. Among these, 12 strains showed highest antimicrobial activity against at least one pathogen. Bacterial growth and antimicrobial compound production in different conditions like pH, temperature were optimized. Production of this antimicrobial compound was done in sterile MSM. Broth was centrifuged and extraction was done using concentrated methanol. Antimicrobial activity were performed against gram positive as well as gram negative bacteria such as E. coli, Proteus vulgaris, Proteus mirabilis, Bacillus cereus, Staphyllococcus aureus, Klebsiella pneumonia by agar well diffusion method. Characterization of antimicrobial compound was done by using silica gel thin layer chromatography. After partial purification by ion-exchange column chromatography, these antimicrobial compounds showed antimicrobial activity. Antimicrobial compound showed high thermal resistance up to 95°c and also resistance to proteolytic cleavage. Molecular weight was determined by polyacrylamide gels electrophoresis.

Keywords – Antimicrobial peptides, soil, ion-exchange chromatography, polyacrylamide gel Electrophoresis.

15. A review on synthesis and evaluation of new Benzimidazole derivatives as potential antimicrobial agents

Mr. B. V. Pathare

B. K. Birla College of Arts, Science and Commerce (Autonomous), Kalyan

E-mail: bala.pathare27@gmail.com

ABSTRACT

In the field of Medicinal Chemistry, the uses of heterocyclic compounds increased day by day, because in many biological materials, heterocyclic compound is a part of its structure. Benzimidazole is a heterocyclic compound which formed by fusion of benzene and imidazole. Benzimidazole contains two nitrogen's as heteroatom. Benzimidazole derivatives are more effective, medicinally useful compounds and extensive biochemicals as it shows structural similarity with purine. Derivatives of benzimidazole have found practical applications in various fields. Derivatives of Benzimidazole show many Pharmacological activities such as antihypertensive, anticancer, antiviral, antidiabetic, antimicrobial etc. Due to the applications of these drugs in treatment of microbial infections and other biological activities, motivates for the development of more potent and significant drugs. Pharmacological studies have been shown that these molecules are effective against various strains of microorganisms.

The antibacterial ability of benzimidazole derivatives explained by their competition with purines resulting in inhibition of the synthesis of bacterial nucleic acids and proteins. The synthesis of novel benzimidazole derivatives remains a main focus of medicinal research. Recent observations suggest that substituted benzimidazoles and heterocyclic, show easy interactions with the biopolymers, possess potential activity with lower toxicities in the chemotherapeutic approach in man.

Keywords: Heterocyclic molecule, Benzimidazole, antimicrobial activity etc.

16. CHEMICAL SYNTHESIS AND CHARACTERIZATION OF LANTHANUM SUBSTITUTED MG –ZN FERRITE

Ramesh A. Bugad [1] and Bharat G. Pawar[1]*

[1]Assistant Professor, Sangola College Sangola, Kadlas Road Sangola, MS, India - 413 307

***Corresponding Author**

Department of Chemistry, Sangola College Sangola, Kadlas Road Sangola, MS, India - 413 307

E-mail: pawarbg12@gmail.com

ABSTRACT

Chemical synthesis of Lanthanum substituted Magnesium Zinc ferrites with general formula $Mg_{0.6}$ $Zn_{0.4}$ $La_{2y}Fe_{2-2y}O_4$ have been synthesized using co-precipitation method. The prepared powder was annealed at 450^0C and their pellets are sintered at 650^0C temperature for 4 hrs. The effects of La^{3+} on structural properties are studied. X-Ray analysis was carried out to confirm the phase formation as well as to calculate lattice constant. The lattice parameter increased with increasing La^{3+} content. The effect of lanthanum substitution was observed on X-ray density, ionic radius and bond length. The prepared Mg –Zn ferrite have possible application in technological field.

Keywords- Co-precipitation, XRD, Mg –Zn ferrite

17. Application of Various Vegetation Indices to Extract Litchi Cultivation Area – A Case Study of Muzaffarpur District, Bihar, India.

Bhartendu Sajan[1*]

[1]Centre for Climate Change and Water Research Suresh Gyan Vihar University Rajsthan, Jaipur-302017, India

E-mail: sajanthakur4994@gmail.com

ABSTRACT

The purpose of this study was to see how well various vegetation indices (VIs) could be used to extract litchi crop area in the Muzaffarpur district of Bihar, India. Litchi cultivation regions were delineated from other land cover categories using VIs derived from the multi spectral bands of Landsat satellites. In this study, ten different VIs were used to map litchi cultivation areas for the years 2016 and 2020, and their effectiveness was compared. The Normalized Green Blue Difference Index (NGBDI) was determined to be the most appropriate for extracting and mapping the litchi cultivation region, according to the findings. The litchi cultivation area numbers were verified and found to be more accurate than the data supplied by the state horticulture department. It was discovered that the amount of Litchi cultivation field rose from 8085.96 ha to 10400.63 ha in the area under investigation over a 14-year period (2006-2020). Litchi fruit spatial distribution maps are an important resource for building a regional action plan to promote the fruit's cultivation and benefits to farmers.

Keywords: Litchi, Satellite image, Vegetation Indices, Accuracy

18. Ag thick film microstrip straight resonator as a moisture sensor for biomaterial

[1]Vaishali Mane, [2]Swati Patil, Vijaya Puri*

[1] Shri Venkateshwara College of Science, Peth, Tal- Walawa, Dist- Sangli .415407
[2] A.C.S. College, Palus, Tal- Palus, Dist- Sangli. 416310
*Thick and Thin film Device Lab, Department of Physics, Shivaji University, Kolhapur. 416004.India
E-mail: vv_mane@rediffmail.com,*vrp_phy@unishivaji.ac.in

ABSTRACT

Measurement of dielectric properties of moist bio granular materials such as cereal grains and oil seed is essential for understanding their electrical behaviour and the development of indirect nondestructive methods for determining their physical characteristics including moisture content and bulk density. Moisture content of seeds is one of the most important characteristics determining quality, proper time for harvest, the potential for safe storage and selling price.

In this paper use of a non-destructive miniaturized Ag thick film microstrip straight resonator for the study of moisture in biomaterials as soybean (Glycine max) seed is suggested. The in-touch overlay (sample in contact with resonator) method provides ease of loading and unloading of sample. A single soybean seed with a known amount of moisture was placed on the microstrip straight resonator at two different positions (even and odd mode). The resonance frequency (fr), bandwith (B) and quality factor (Q) of the resonator were calibrated against the moisture content. The sensor was studied in the moisture range of 4-62 % (on a wet-weight basis), the actual moisture values being obtained by an oven drying method. As moisture content increases resonance frequency (fr) and quality factor (Q) decreases while bandwidth (B) increases. Even mode was more sensitive to moisture than odd mode. The errors in moisture estimation with fr for even and odd were ±1.89% and ±1.94% respectively. The corresponding values with B and Q for odd mode were ± 2.03% and ± 2.09% respectively.

Key words: microwaves; biomaterial; resonator; moisture content.

19. Effect of Plant Growth Promoting Rhizobacteria on Secondary Metabolites of Medicinal Plant

Ruddhi. R. Jagtap[1, 2], Gajanan. V. Mali[2*], Kailas. D. Sonawane[1*]

1. Department of Microbiology, Shivaji University, Kolhapur, MS, India
2. Rayat Institute of Research and Development, Satara, MS, India

E-mail: kds_biochem@unishivaji.ac.in, E-mail: gajamali@rediffmail.com

ABSTRACT

Plant growth promoting rhizobacteria (PGPR) are naturally occurring soil bacteria that aggressively colonize plant roots and benefit plants by providing growth promotion. In the present study, 65 isolates of PGPR were obtained from the rhizospheric soil samples of 20 different localities. Among these, two potent isolates were selected on the basis of their plant growth promoting activities such as phosphate solubilization, IAA production, nitrogen fixation, zinc and potassium solubilization, HCN production and ammonia production. They were further used to study their effect on growth parameters and secondary metabolites of turmeric by pot culture experiment. It was found that both PGPR significantly increase the plant growth parameters such as size and number of leaves, size and number of rhizome, root length, biomass and secondary metabolites (curcumin and flavonoids) content, after 45, 90 and 180 days. Thus, we conclude that these PGPR may function as biofertilizers, bioinoculants, bioprotectants and biostimulants for turmeric.

20. One-pot, three-component reaction for efficient synthesis of 4H-isoxazole- 5-ones using ZnO nanoparticles as green catalyst

Sanjay S. Ghevadea*, Santosh B. Kambleb, Kiran N. Patila

[a] Department of Chemistry, Dr. Ghali College, Gadhinglaj, Maharashtra 416502, India
[b] Department of Chemistry, Yashavantrao Chavan Institute of Science Satara, 415001, India

*Corresponding Author E-mail: sanjayg85@gmail.com

ABSTRACT

A mild and convenient route for the synthesis of isoxazole has been developed by a reaction of various aldehydes, ethyl acetoacetate and hydroxylamine hydrochloride using ZnO nanoparticles as a catalyst under MW. A variety of functional groups was tolerated under the reaction conditions employed. Moreover, the catalyst was recovered and reused several times without significant loss of its catalytic activity. The merits of this method are efficiency, simplicity, clean, easy work-up and shorter reaction times.

Keywords: Isoxazole, Aromatic aldehyde, EAA, Hydroxylamine hydrochloride, ZnO nanoparticles.

21. A simple and an efficient one pot synthesis of Hantzsch 1,4-dihydropyridines using 5- sulphosalicyclic acid (5- SSA) as an organocatalyst

Kiran N. Patil [a*], Tejas S. Ambi[a], Rohan B. Dalavi[a], Vinayak B. Gaykwad[a], Shubham A. Kavale[a]

Department of Chemistry, Dr. Ghali College, Gadhinglaj, Maharashtra 416502, India

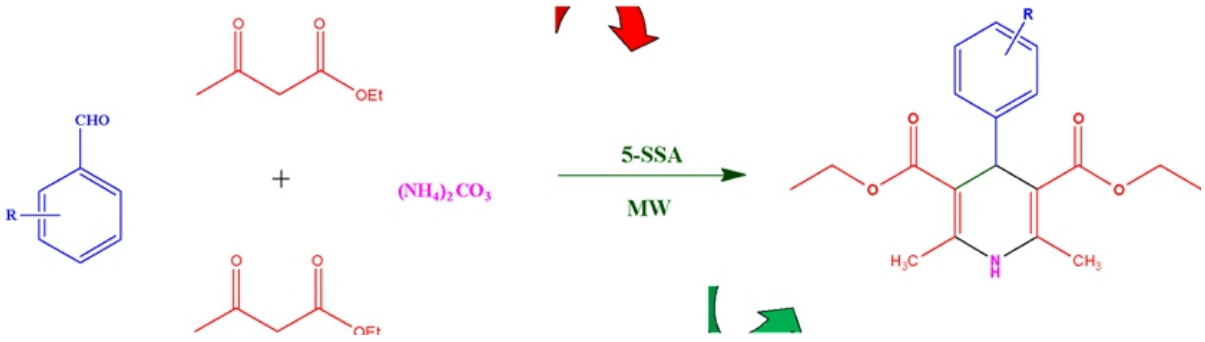
*Corresponding Author E-mail: kiranpatil277@gmail.com

ABSTRACT

An efficient, synthetic route for the Hantzsch reaction was developed for the synthesis of 1,4-dihydropyridines by a reaction of aldehyde, ethyl acetoacetate and ammonium carbonate using 5-sulphosalicyclic acid as an organocatalyst. Using microwave heating reaction times were reduced from 3 hr to 10 min. The advantages for this protocol are mild reaction conditions, easy work-up, metal free environment, operational simplicity, green approach, higher yield of the product.

Keywords: 1,4-dihydropyridines, Metal free environment, Microwave Irradiation, Organocatalyst, Green Chemistry etc.

Graphical Abstract:



22. Diversity of marginal plants of some water bodies in Gadhinglaj Tahsil and their ecological significance.

Sawant R. S*., Patil A.P., Patel J. S. and Patil S.M.

Department of Botany, Dr. Ghali College Gadhinglaj, 416502 (MS)

* Corresponding Author E-mail: rss.botany@gmail.com

ABSTRACT

Gadhinglaj Tahsil (Kolhapur District) located at Northern Western region of Maharashtra. Forty four manmade water-bodies are recorded from 90 villages present in this Tahsil. Out of 44 water bodies, we studied 9 water-bodies. The plants present at peripheries of these water-bodies are enlisted here. These marginal plants are with all kinds of habits including herbs, shrubs, trees, climber and grasses. Marginal plants include plants of Reed-swamp stages and Sedge Marsh or Meadow stage. Majority of the vegetation studied was found to be naturally occurring. About 109 Angiosperms and two ferns were recorded around the water bodies. The present work reflects not only ecological role of marginal vegetation (as producer and habitat providers) but role in succession of the flora and fauna around the water-bodies.

23. Brine shrimp lethality assay of leaves of *Bauhinia acuminate Linn*

Mohsin J. Jamadar[1]*, Preeti Khuble[2] and Shrinivas Mohite[3]

[1.] Appasaheb Birnale college of Pharmacy, Sangli
[2.] School of Pharmacy, Suresh Gyan Vihar University, Mahal Jagatpura, Jaipur.
[3.] Rajarambapu college of pharmacy, kasegaon.

ABSTRACT

The present study was conducted to test for in vivo Brine Shrimp Lethality Assay (BSLA) of the ethanolic and aqueous extracts of *Bauhinia acuminate* Linn. Brine shrimp lethality assay is an important tool for the preliminary cytotoxicity assay of plant extract and others based on the ability to kill a laboratory cultured larvae (nauplii). The nauplii were exposed to different concentrations of plant extract for 24 hours. The number of motile nauplii was calculated for the effectiveness of the extract. It is a simple, cost effective and requires small amount of test material.

Novel cytotoxic, compounds can be isolated from potential plant sources through the assessment of cytotoxic activity against brine shrimps. Cytotoxicity was evaluated in terms of LC50 (lethality concentration). Aqueous extracts of *Bauhinia acuminate* Linn showed LC50 values of 162.38 (µg/mL) and ethanolic extracts of *Bauhinia acuminate* Linn showed LC50 values 75.94 (µg/mL). It indicated that bioactive components are present in these plants that could be accounted for its pharmacological effects. Thus, the results support the uses of these plant species in traditional medicine.

Keywords: Brine shrimp lethality assay, *Bauhinia acuminate* Linn LC50, Cytotoxicity.

24. Review of Ethnofloristic diversity of Kharepatan village in Kankavali tehsil of Sindhudurg District, Maharashtra

Prajyot S. Nalawade[1], Sharmin H. Kazi[1], Mangal A. Parab[1], Ruchi N. Teli[1], Kavita P.Amkar[1]and Pratik D. Natekar[2]

[1]Arts, Commerce & Science College Kharepatan, Tal.-Kankavali, Dist.-Sindhudurg, Maharashtra(India)1.

[2]Dattajirao Kadam Arts, Science & Commerce College, Ichalkaranji, Dist.-Kolhapur, Maharashtra (India)2.

* Corresponding Author E-mail: nalawadeprajyot9@gmail.com

ABSTRACT

Kharepatan village is a historically and commercially important village in Sindhudurgdistrict. The area of village is compactly covered with semi evergreen forest. People's usedvariety of plants for the medicinal purpose and on other hand fluctuating global environment isworstly affecting on plant treasure. This study carries variable source of information fortraditional medical experts and plant researchers. In this paper we have tried to enlistethnofloristic diversity of Kharepatan village. Present investigation revealed that 71 Species of70 Genera belonging from 46 families have been used as medicinal plants. Among this researchApocynaceae is more dominant family which comprises 8 genera & 8 species. In this point ofview we have try to document more medicinal plants with their medicinal properties from thisvillage.

Keywords: Ethnofloristic, Kharepatan, Medicinal plants, Survey.

25. Optimization of Synthesis parameters for CNTs Using Olive Oil

Gaud Brijesh [1], Singh Amrita [1], Kshirsagar Datta [2] and Jaybhaye Sandesh [1*]

[1]Department of Chemistry, B. K. Birla College (Autonomous), Kalyan.
[2]Department of Physics, B. K. Birla College (Autonomous), Kalyan

* Corresponding Author E-mail: brijeshgaud524@gmail.com

ABSTRACT

In this research paper we optimized the synthesis parameters of Carbon Nano Tubes using Taguchi optimization techniques. The synthesis of CNTs was carried using Olive oil as Carbon Source. Optimized synthesis parameters for synthesis of CNTs from olive oil are when olive oil was deposited over Ni-Co NPs as catalyst at 900° C temperature for 90 min gives good yield and control of inner diameter of CNTs. Using optimized parameters, the synthesis of CNFs was carried out. The morphology of CNT was analyzed using X-ray diffraction (XRD), Scanning electron microscopy (SEM), Energy dispersive X-ray spectroscopy (EDS), High resolution Transmission electron microscopy (HR-TEM) and Raman Spectroscopy. CNTs have tube like structure and inner diameters of CNTs are in the range of 40-70 nm. EDAX spectrum which confirmed the removal of metal NPs used in synthesis after acid treatment of CNTs

Keywords: Carbon Nano Tubes, Taguchi Optimization, X-Ray Diffraction, Scanning Electron Microscopy

26. CROP MAPPING USING MULTPLE SENSORS WITH MACHINLE LEARNING METHOD ON GEE PLATFORM

Priyanka Gupta[1], Dr. Varun Narayan Mishra[2]

*Centre for Climate Change and Water Research, Suresh Gyan Vihar University, Jaipur

E-mail: er.priya@gmail.com, varunnarayan.mishra@mygyanvihar.com

ABSTRACT

Currently Geospatial Big Data gained massive attention and are showing globally. For Remote sensing and GIS data processing Google Earth Engine (GEE) is currently the hot platform, which is widely used. Many problems are arising in Agriculture monitoring and food security, to resolve these problems require perfect crops mapping. Currently few studies regarding the usage of GEE platform to study crop classification. The objective is to evaluate the classification of crops using multiple Machine Learning Algorithms (MLA) and multiple sensors (LANDSAT 8 and SENTINEL 2) with free cloud-based platform GEE. For this purpose, we use Landsat 8(OLI) and SENTINEL 2 data, various methods of ML are applied, then compare all method and sensor's result. Although all classifier gives good result but GTB gives best accuracy as 96% in comparison with RF, SVM, Gradient Tree Boost. This study discussed strength and weaknesses of classifier, determine accuracies that can be gained with different classifiers for the study area Mathura (Uttar Pradesh). We found that GEE produce very good output (result) through cloud platformed and support Remote Sensing product with pre- processing in terms of classification accuracy, the ML based approach outperformed CART, RF, GTB and many more classifier are available in GEE. With minimal human interaction and interference GEE has performed fast and well in term of time and processing complexity of multiple dataset and multiple ML methods. GEE has proven to be reliable for achieving the objectives of this study to evaluate the classification of crops with multiple ML methods of study area Mathura (Uttar Pradesh) and give base for further analysis.

This work intends to systematically address these knowledge gaps in light of the development of studies addressing in research issues through multi-temporal analysis using cloud computing platforms. Proposed study evaluates the reaction of five supervised classifiers accessible in the GEE cloud computing platform's online JavaScript API to the use of various combinations of input imagery, training data, and band sets for crops classification. The main goal of proposed paper is to assess the feasibility of using Google Earth Engine (GEE) to study crop classification in the Mathura, by determining the extent of crop mapping using multiple Machine Learning Algorithms (Classification and Regression Trees (CART), Random Forest (RF), Decision Tree (DT) and Support Vector Machine (SVM) in the Google Earth Engine (GEE) platform. Following that, the best categorization findings were used to quantify and map the temporal changes in crop classification over the study area. In the proposed study GTB in both sensors gives best accuracy as 86.7% in Landsat 8 OLI and 84.2 % in Sentinel 2. RF also gives accuracy as 82.5% in Landsat and 82.3% in Sentinel 2. In this study there are six classes as urban, water body, vegetation, wheat, mustard and other crops in both sensors. On the basis of classes, we calculate Producer, user and Kappa coefficient for both Sensors.

Keywords: Google Earth Engine, Optical Satellite imagery (Landsat 8 OLI), Sentinel 2, vector data, CART (classification and Regression Technique), RF (Random Forest), Gradient Tree Boost (GTB), Support vector machine (SVM), Decision Tree (DT).

27. Phytochemical and antibacterial study of rhizome and leaf extract of Cryptocoryne cognata Schott

Inamdar FR[1], Wadkar SS[1], Gurav RV[2],

[1.]Department of BioTechnonology, Smt. K. W. College, Sangli, Maharashtra, India

[2.]Department of Botany, Shivaji University, Kolhapur, Maharashtra, India

ABSTRACT

Herbal products have recently become highly valuable due to their wide applications. The important steps towards the progress of pharmaceutical are the accurate identification active constituents, their detailed biological assays, formulation of dosage and finally clinical trials to establish safety and efficacy of new drug. Leaf and rhizome of *Cryptocoryne cognata* Schott have been selected for phytochemical screening to identify the different classes of secondary metabolites. Antibacterial activity of different solvent extracts of leaf and rhizome were carried out by using agar well diffusion method. Minimum inhibitory concentration (MIC) was determined by serial dilution technique. The inhibitory effect was studied using the growth pattern of these test organisms. GC-MS analysis was also done to determine the secondary metabolite profile. Phytochemical screening showed the presence of active compounds such as alkaloids, coumarins, flavonoids, saponins, tannins and glycosides. The ethanolic and methanolic extracts of both rhizome and leaf of both the species of *Cryptocoryne* showed good antimicrobial activity against Gram positive bacteria. Ethanolic extract of rhizome and leaf was found with highest inhibition efficacy in terms of its MIC (200 µg/ml) and (250 µg/ml) against *Micrococcus aureus* (NCIM 2802) and *Bacillus subtilis* (NCIM 2045). This is primarily due to the presence of 2-Ethoxy-3-chlorobutane, Menthol, Santalol, Cis- alpha Santalol, trans-.beta Santalol in the ethanolic extracts of rhizome. These extracts revealed the presence of bio-active constituents which are known to exhibit medicinal properties so it may act as effective sources of natural antimicrobials.

Keywords: MIC; GC-MS; *Cryptocoryne cognata*; *Micrococcus aureus.*

28. Estimation of Phytoconstituents, Soil characterization and isolation of Arbuscular Mycorrhizal fungi from *Curcuma longa* L.

R. S. Nikam, N. B. Mane

Department of Botany, Yashavantrao Chavan Institute of Science, Satara (Autonomous)
Shivaji University, Kolhapur

Corresponding author: nbmane123@gmail.com, nikamrajani1999@gmail.com

ABSTRACT

Present study was undertaken for the study of phytochemical analysis, soil characterization and isolation of Arbuscular Mycorrhizal fungi in the Rhizosphere of *Curcuma longa* L. Collect the soil samples from Ambheri from Satara District of Maharashtra India. The soil samples of *Curcuma longa* screened for its physiochemical properties. The root powder of test plant showed maximum amount Alkaloides, Flavonoides, and Protein and Carbohydrate, Phenol Tannin Saphonin were recorded minimum. Isolation of AM fungi attributed with Glomus and Acaulospora.

Keywords: Arbuscular Mycorrhiza, *Curcuma longa, Glomus, Acaulaspora,* Alkaloide

29. The role of biofilm forming bacteria as bio-fertilizer and biocontrol agent against *Ralstonia solanacearum*

Trupti K. Gade[1,2], Shirishkumar V. Supanekar[2*], Kailas D. Sonawane[1*]

[1]Department of Microbiology Shivaji University Kolhapur, MS, India,
[2]Rayat Institute of Research & Development.

E-mail: kdsbiochem@unishivaji.ac.in, svsupanekar@rediffmail.com

ABSTRACT

For integrated nutrient management the use of bio-fertilizers is one of the important, as they are cost effective and renewable source of plant nutrients to supplement the chemical fertilizers for sustainable agriculture. In the present review bio-fertilizer produced here by the efficient isolates having the capacity of biofilm formation and acting as biocontrol agent against the plant pathogen of solanacae family *Ralstonia solanacearum*. The *R. solanacearum* itself produce biofilm through quorum sensing and is one of the plant pathogen which cause bacterial wilt disease in most of the solanacae family plants such as potato, tomato, eggplant, pepper, tobacco and banana. The pathogen in these plants blocks the xylem vessels and produce disease. In this study, the biocontrol of *R. solanacesrun* will takes place by terminating the biofilm formation of the respective plant pathogen.

30. LIQUID ASSISTED GRINDING AS ENVIRONMENTALLY BENIGN PROTOCOL FOR SYNTHESIS OF 6-AMINO-3-METHYL-4-PHENYL-1, 4-DIHYDROPYRANO[2,3-*C*]PYRAZOLE-5-CARBONITRILE DERIVATIVES AS CYSTINYL AMINO PEPTIDASE INHIBITORS AND ANTIHYPERTENSIVE AGENTS

P. R. Kharade[1,2*], U. B. Chougale[1,2] and S. R. Dhongade[1]

[1]Research Laboratory in Heterocyclic Chemistry, Devchand College, Arjun-nagar, Tal. Kagal, Dist. Kolhapur, 591269 (MH), India.

[2]Karmaveer Hire Arts, Science, Commerce and Education College, Gargoti, Tal. Bhudargad, Dist. Kolhapur, 416209 (MH), India.

Corresponding author: pravinkharade03@gmail.com

ABSTRACT

A series of 6-amino-3-methyl-4-phenyl-1,4-dihydropyrano[2,3-c]pyrazole-5-carbonitrile derivatives were synthesized by liquid assisted grinding of pyrazolone, malononitrile and different substituted aldehydes. The liquid system used for the synthesis is ethanol and water in 80:20 proportion respectively. The synthesized derivatives were characterized by spectral methods viz. IR, NMR and Mass and there structures were confirmed on the basic of spectral data obtained. The structures of all the derivatives were further screened for their biological activities by using computer web-based program PASS. All the synthesized compounds were found as Cystinyl amino peptidase inhibitors and antihypertensive agents. The compound 1a (Pa value = 0.77) was found to show highest activity as Cystinyl amino peptidase inhibitors and the compounds 2a and 3a (Pa value = 0.54) were found to show highest activity as antihypertensive agents

Keywords- Pyrazolone, grinding, Cystinyl amino peptidase and antihypertensive agents etc

31. DESIGN, SYNTHESIS, CHARACTERIZATION AND BIOLOGICAL EVALUATION OF SOME NEW ARYL-PYRAZOLE BASED CHALCONES AS ANTICANCER AGENTS

U. B. Chougale[1,2*], P. R. Kharade[1,2], H. V. Chavan[3], S. M. Deshmukh[4], K. N. Patil[5] and S. R. Dhongade[1*]

[1]Research Laboratory in Heterocyclic Chemistry, Devchand College, Arjun-nagar, Tal. Kagal, Dist. Kolhapur, 591269 (MH), India.
[2]Karmaveer Hire Arts, Science, Commerce and Education College, Gargoti, Tal. Bhudargad, Dist. Kolhapur, 416209 (MH), India.
[3]Department of Chemistry, A S. P. College, Devrukh, Dist. Ratnagiri (Autonomous), 415804 (MH), India.
[4]Department of Chemistry, V.N.B.N. Mahavidyalaya, Shirala, Dist. Sangali, 415408 (MH), India.
[5]Dr. Ghali College, Gadhinglaj, Tal. Gadhinglaj, Dist. Kolhapur, 416502 (MH), India.

E-mail: uttamchougale1985@gmail.com

ABSTRACT

A series of aryl-pyrazole based chalcones were synthesized through sequential condensation reactions. Initially 5-chloro-3-methyl-1-phenyl-1-H-pyrazole-4-carbaldehyde precursor was synthesized from ethyl aceto acetate and phenyl hydrazine which on Claisen-Schmidt condensation with various active hydrogen compounds gives final chalcone derivatives. The structures of synthesized derivatives were confirmed on the basis of their spectral data and then confirmed structures were screened for their anticancer activity. Among the compounds tested **6l** Displays potential anticancer activity against MCF-7 breast cancer cell line.

Keywords: Vilsmeier-Haack Reaction, aryl-pyrazole chalcones, anticancer, active methylene compound, Breast cancer cell line etc.

32. Antiviral Potential of Medicinal Plants –Influential Immunity Boosters for the Pandemic of Covid-19

Dr Anjali P. Patil

Head, Department of Botany, R.B. Madkholkar Mahavidyalaya,
Chandgad, District-Kolhapur, Maharashtra -416509

E-mail: anjalimane1972@gmail.com

ABSTRACT

In the present study few antiviral medicinal plant from Chandgad region are reported with their ayurvedic medicinal importance and active principles. A total of 25 medicinal plants belonging to 21 different families were recorded. Out of which two were monocotyledons and 23 were dicotyledons. Present investigation was undertaken to study plant resources and updated practical activities like extracts preparations or poultice applied to the body to alleviate inflammation as well as to cure human health disorders. In our study, major source of medicine were leaves in 6 plants- *Azadirachta indica* A. Juss., *Ocimum sanctum* Linn. *Nyctanthes arbortristis* Linn.,. *Centella aciatica* L. Urb., *Adhatoda vasica* Medic., *Tridex procumbens* L. fruits in 11 plants- *Emblica officinalis* Gaerth. *Piper nigrum* L., *Citrus sinensis* L., *Garcinia indica* Du petit Thou. Choisy , *Carica papaya* Linn. *Punica granatum* Linn., *Helicteres isora* L. *Syzygium cumini* L. Skeels, *Aegle marmelos* Corr., *Swietenia mahagoni* (L.) jacq., *Terminalia chebula* Retz., stem in 3 plants- *Holarrhena antidysentrica* Wall., *Tinospora cordifolia* (willd.) Miers ex., Glycyrhiza glabra L., rhizome in 2 plants- *Curcuma longa* L., *Zingiber officinale* Rosc., Floral bud in 1 plant- *Syzygium aromaticum* L., bulb in 1 plant- *Allium sativum* L. and bark in 1 plant- *Cinchona offcinalis* (L.) Ruiz. These medicinal plants have antiviral properties due to presence of various complex chemical substances so it is necessary to conserve the precious treasure of plants since medicinal plants gives powerful immunity boosters designed for the pandemic of covid-19 situation.

Key words : Antiviral, Medicinal plants, Chemical constituents, Uses, Families.

33. OXIDATION OF BENZ AND *m*-TOLUIC ACID HYDRAZIDES BY THALLIUM(III) IN ACIDIC MEDIUM

A. S. Varale

Department of Chemistry, Athalye-Sapre-Pitre College, 415 804
Devrukh, Dist-Ratnagiri Maharashtra State, India

E-mail: amitvarale@aspcdevrukh.ac.in

ABSTRACT

The reaction between thallium (III) and benz and *m*-toluic acid hydrazides was carried out in a mixture of perchloric and hydrochloric acid medium. The reaction proceeds through formation of complex with reactant, which decomposes in subsequent steps to give product. Effect of acrylonitrile shows, that there is no formation of free radicals. The increase in $[H^+]$ and $[Cl^-]$ decreases the rate of the reaction. The increase in ionic strength does not affect the rate of reaction. The effect of temperature was studied at four different temperatures ranging from 15 to 30^oC. The activation parameters were also determined and a mechanism is predicted.

Keywords: kinetics, thallium(III), oxidation, Benzoic acid hydrazide i.e. Benz hydrazide (BAH), m-Toluic acid hydrazide (m-TAH)

34. Phytochemical Evaluation of Ethanolic and Ethyl acetate extracts of *Cyamopsis tetragonoloba* (L).Taub

Salma Akbar Bagwan* and Nilofar S. Naikwade

Department of Pharmacology, Appasaheb Birnale College of Pharmacy, Sangli

E-mail: salmabagwan233@gmail.com

ABSTRACT

Cyamopsis tetragonoloba (L).Taub is an annual legume which is widely consumed by the people and has various traditional uses. Objective of this to study phytochemical screening the Ethanolic and Ethyl acetate extract of *Cyamopsis tetragonoloba* (L).Taub

The preliminary phytochemical screening result showed the presence of alkaloids, protein carbohydrate, glycoside Tannis, flavonoids, sterol and saponin in the ethyl acetate extract of *Cyamopsis tetragonoloba* (L).Taub And ethanolic extract of *Cyamopsis tetragonoloba* (L).Taub showed the presence of alkaloid, carbohydrate, glycoside, Tannis, flavonoids, sterol and saponin.

In conclusion the Ethanolic and Ethyl acetate extract of *Cyamopsis tetragonoloba* (L).Taub were evaluated for preliminary phytochemical screening and showed presence secondary metabolite like of flavonoids and alkaloids.

Keyword - Ethanolic extract of *Cyamopsis tetragonoloba* (L).Taub, Phytochemical screening and Ethyl acetate extract of *Cyamopsis tetragonoloba* (L).Taub

35. Occurrence of Arbuscular Mycorrhizal Fungi and qualitative analysis of *Crozophora plicata* (Vahl)

T. S. Khandagale, N. B. Mane

Department of Botany, Yashavantrao Chavan Institute of Science,
Satara (Autonomous) Shivaji University, Kolhapur

Corresponding author: nbmane123@gmail.com, tkhandagale98@gmail.com

ABSTRACT

The *Crozophora plicata* (Vahl) belongs to family euphorbiaceae from drought prone area Wathar station in Satara District were investigated for occurrence of arbuscular mycorrhizal fungal association. Collect the test plant and screened for qualitative determination and occurrence of (AM) fungi. The result were reported from rhizopsphere soil of test plant are two genera, Aculospora and Glomus. Glomus ((7) are maximum than Acaulospra (1). Qualitative analysis was carried out from fruit and leaf of test plant. Carbohydrate, Phenol, Saponin, Flavonoid, were found more while Alkaloid Protein, Tannin and Glycosides were recorded less.

Keywords: Arbuscular Mycorrhiza, *Crozophora plicata, Glomus, Acaulaspora*

36. Stress Survey of Students to understand the major stressors during the period of Covid -19 Pandemic lockdown.

Dr. Sheetal B. Juneja (Banerjee)

Assistant professor, Department of zoology
Dhote Bandhu Science College, Gondia (M.S)

E-mail: sheetalbhaskar107@gmail.com

ABSTRACT

During Covid -19 Pandamic College students experienced Stress related responses due to fear of contagion and to limitations of personal and relational life . The intensity and frequency of behavioral, cognitive, and emotional responses of students during this period has also been affected. The COVID-19 pandemic has affected the mental health and social, emotional, psychological, and educational well-being of everyone. Taking Cognizance of this Women Cell of Dhote Bandhu Science College Gondia, Maharashtra, India prepared a questionairee using Student Stress Survey template . The purpose of this questionnaire was to capture feedback about major stressers they experienced during the academic year with Covid -19 and how they handled that. This paper documents the findings from online interview surveys conducted through google form in a large institutional system in Dhote Bandhu Science College ,Gondia, M. S. India. The study provided a brief, valid and reliable measure to assess perceived stress to understand the impact of lockdown amongst College students which will be helpful in developing tailored interventions fostering their wellbeing.

Keywords: Covid -19, student Stress, College Students, Physical and Mental Well Being.

37. Extract of Pomegranate Peels (EPP): a Bio-Waste Heterogeneous Catalyst for Sustainable Synthesis of Biscumarin Derivatives

Appasaheb T. Birajdar

Shikshamaharshi Dr. Bapuji Salunkhe college, miraj.
(Affiliated to Shivaji university, Kolhapur)

E-mail: appu.birajdar12@gmail.com

ABSTRACT

Biscumarin derivatives were efficiently prepared from variously substituted aldehydes and 4-hydroxycoumarin in water by using extract of pomegranate peels (EPP) as a catalyst. The EPP-catalyst was obtained from bio-waste by simple thermal treatment to dry peels of pomegranate fruit. The analysis revealed that the present catalyst has basic sites which promote the synthesis of desired products. The main attractions of our protocol are utilization of highly abundant bio-waste-derived catalyst and good-to-excellent yield in shortest reaction time.

Keyword: Bio-waste · Pomegranate peels · Natural catalyst

38. FACILE FABRICATION OF DURABLE CANDLE SOOT - WAX COMPOSITE COATED SUPERHYDROPHOBIC STAINLESS STEEL MESH FOR OIL-WATER SEPARATION APPLICATION

Mehejbin R. Mujawar [1]*, Rajesh B. Sawant [1], Deepak A. Kumbhar [1], Krishna K. Rangar [1], Govind D. Salunke [1], Sanjay S. Latthe [2], Suresh S. Patil [1] and Shivaji R. Kulal [1]*

Department of Chemistry, Raje Ramrao Mahavidyalaya, Jath. Dist. Sangli (MS) India. (Affiliated to Shivaji University, Kolhapur) 1 and Self-cleaning Research Laboratory,

Department of Physics, Raje Ramrao Mahavidyalaya, Jath. Dist. Sangli (MS) India. (Affiliated to Shivaji University, Kolhapur) 2, and Affiliation 3

E-mail: srkulal@gmail.com, mehejabeenmujawar@gmail.com

ABSTRACT

Nowadays, the Lotus leaf-inspired superhydrophobic coating has been used in various industrial applications. Among them, the use of superhyrophobic materials for potential application prospects such as oil-water separation has gained growing interests. However, a simple and low cost strategy for fabrication of durable superhyrophobic materials remains a major challenge. The separation of oil-water mixture is one of the most important applications of superhydrophobic coating. Herein, the superhydrophobic coated stainless steel mesh can be separate easily oil from oil-water mixture. The candle soot has the advantages of cost-effectiveness and production scalability over other carbons (i.e. graphene, carbon nano-tubes, etc.) in the synthesis. The superhydrophobic coated mesh can be separate easily oil from oil-water mixture. The present work describes facile fabrication method of preparation of superhydrophobic stainless steel mesh. The layer of candle soot particles deposited on mesh by holding in the middle part of candle flame and thereafter wax deposited using dip-coating method to form the candle soot-wax composite coating. The water contact angle was 155° and oil contact angle nearly 0° revels formation of superhydrophobic stainless steel mesh that efficiently separate oil- water mixture. So, these superhydrophobic mesh can be applicable to use in industries for oil-water separation.

Keywords: Candle soot, superhydrophobic, stainless steel mesh, dip-coating method and oil-water separation.

39. Variability of UV Irradiance measured by MICROTOPS II at Kolhapur station.

Akshay S. Patil [1], Rani Pawar [1, 2], Sanket Mali [2] Dada P. Nade [3].

[1] Earth and Space Science Research Centre, Department of Physics,
Sanjay Ghodawat University, Kolhapur
[2] Department of Basic Sciences and Humanities, Sanjay Ghodawat Group of Institutions, Atigre
[3] Dr. Patangrao Kadam Mahavidyalaya, Sangli

ABSTRACT

The highly advanced Microtops II Ozonometer has been used for the measurement of ozone over Atigre village near to Kolhapur. Micrometer II Ozonometer contains the five optical filters (five channels) for solar irradiance measurements at five different wavelengths (305.5 nm, 312.5nm, 320.5nm, 936 nm and 1020 nm). Out of five, sequentially first three filters are used to measure the ultra-violet (UV) irradiance which are coming from the sun. Atigre village (16.74°N latitude, 74.37°E longitude, 604 meters altitude above sea level) is placed at low latitude stations and it is a unique station for the atmospheric study since it is covered by many small as well as large scale industries and urban activity.

In this work, we have studied the variabilities in the UV irradiance and it's seasonal, daily and diurnally variability for the considered time periods. There is a well-known inverse relationship between ozone and UV irradiation. Increased UV radiation indicates depletion of stratospheric ozone concentration. We have observed that UV irradiation decreases from monsoon to winter and then increases towards the summer season. Such variations are also caused by the apparent position of the sun. We also discovered that UV irradiance fluctuates daily, indicating synoptic ozone variation and the influence of meteorological variables on ozone. We used a few days from a certain month to show the UV irradiance's diurnal behavior. The diurnal structure of UV irradiance is found to be bell-shaped, with seasonal variations in its amplitude.We have discussed the possible mechanism for variation of UV radiations in the Kolhapur region.

Keywords: Microtop-II ozonometer, UV Irradiance.

40. Quality by Design (QbD) approach: Estimation of related impurities of Elagolix sodium drug

Shrikant Babar [1], Amit Supale [2], Rohant Dhabbe [1], Sandip Sabale [1]*

[1] Department of Chemistry, Jaysingpur College, Jaysingpur-416101, MS, India
[2] Department of Chemistry, Dr. Patangrao Kadam Mahavidhyalaya, Sangli-416416, MS, Dr. Reddys Laboratories Ltd. Hyderabad, India

E-mail: shrikantbb2712@gmail.com (SB); srsabale@gmail.com (SS)

ABSTRACT

This study finalized a short method for estimation of related impurities of Elagolix sodium on Ultra Performance Liquid Chromatography (UPLC) by using Quality by Design approach (QbD) approach. A two factorial design was used to understand which method parameter (pH of mobile phase, column flow rate or gradient composition of the mobile phases) have high impact on the resolution between the impurities and main peak symmetry. QbD study also provided a design space for method parameters within which a method obeyed with the set acceptance criteria. The separation of the known impurities is achieved on Acquity BEH C18, 100*2.1*1.7 µm column with buffer as 0.1 % ortho phosphoric acid in water and pH adjusted with potassium hydroxide to 3.1, measured at 210 nm wavelength. The developed method was successfully applied to the bulk drug analysis and also for forced degradation studies. Forced degradation was carried out with acid hydrolysis, base hydrolysis, thermal degradation, photolytic degradation of the Elagolix sodium.

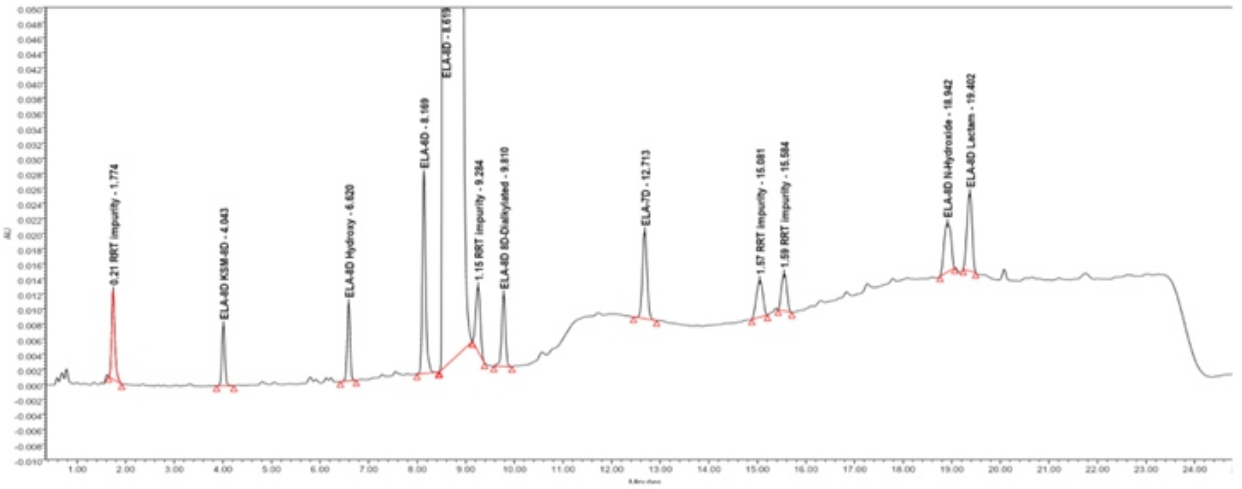


Figure: A chromatogram of Elagolix sodium with 11 known impurities

41. Estimation of Ground Water Quality of Sangli-Miraj-Kupwad Industrial Area

Powar S. K.

Smt. Kasturbai Walchand College of Arts and Science, Sangli

ABSTRACT

In this article inference pertinent to physico-chemical and biological parameters of Ground Water is studied. The physical parameters include pH, Electrical Conductivity (EC), Total dissolved solids (TDS), Turbidity, Total Hardness, Magnesium, Sodium, Potassium, Sulphate, Nitrate, Chlorine whereas Heavy Metals such as Copper, Ferrous, Cadmium, Mercury, Lead and Arsenic are analysed. The inference is based upon the groundwater samples data, extracted from Sadamate and Patel (2015), with reference to above parameters collected in polyethylene bottles from 17 respective bore-well stations in Sangli-Miraj-Kupawad industrial area situated at Miraj taluka in Sangli District, Maharashtra, India with geographical coordinates 16° 52' 0" North, 74° 34' 0" East. The inference includes estimating proportion of stations required to be monitored with respect to above mentioned parameters and fitting statistical distributions to the data of these parameters. The study reveals that there is need of monitoring of some stations with respect to above parameters.

Key-words: Ground water, Monitoring, Fitting Distributions, Percentiles.

42. Effects of Sulphate and Salt Sources on the growth of *Alternaria alternata* causing *Alternaria* blight of Chickpea

S. N. Inamdar [1] and M. B. Waghmare [2]

[1] Department of Botany, Miraj Mahavidyalaya, Miraj - 416410. (M. S.)
[2] Professor and Head, Department of Botany, The New College, Kolhapur- 416012.(M. S.)

E-mail: [1]snioasis@yahoo.com, [2]drmahendrawaghmare@gmail.com

ABSTRACT

Chickpea is an important pulse food crop in India. It get infected by many fungi where *Alternaria alternata* (Fr.) Keissl was found to be dominant among the diseased samples collected during investigation. From these samples of *Alternaria alternata*, wild sensitive (Aa-1) and highly resistant (Aa-11) isolates were identified using carbendazim. Different sulphate and salt sources were used to examine their response to pathogen either stimulant or inhibitory during culture of the pathogen (in vitro). The aim of the present investigation was to evaluate different sulphate and salt sources on disease development of chickpea caused by *Alternaria alternata*. The radial mycelial growth of pathogen was examined for its response to these sources. The use of sulphate and salt sources when grown on Czapek Dox agar medium, showed variable response during cultural conditions. The response was either stimulant or inhibitory.

Keywords- Chickpea blight , *Alternaria alternata*, sulphate and salt sources

43. Physico-chemical analysis of soils from crop fields in Baramati Tehsil Dist. Pune, Maharashtra, India.

Torane S.N.[1], Shete R.S. *[2], Chavan S.J., Mali B.S.

Post graduate Research Centre , Department of Botany
Tuljaram Chaturchand College of Arts, Science and Commerce, Baramati (Autonomous). Dist. Pune, Maharashtra, India 413102
*2 Shri Sant Damaji Mahavidyalaya, Mangalwedha, Dist. Solapur 413305

E-mail: swarajtorane575@gmail.com

ABSTRACT

The soil test based nutrient management has emerged as a key issue in efforts to increase agriculture productivity. In the present investigation study focus on the physico- chemical analysis of a soil from crop fields in Baramati Tehsil region. During study preferred to investigate the soil samples for its physico-chemical analysis of some parameters. Total 30 soil samples collected from 15 sites during winter to summer season of December 2020 to February 2021. Collected soil samples from crop fields analyzed for parameters A physico- chemical study of soil is based on various parameters like soil pH, electrical conductivity (EC), organic carbon (OC), available nitrogen (N), phosphorus (P), potassium (K), Sodium (Na), Calcium Carbonate ($CaCO_3$) and micronutrients (Fe, Mn, Cu and Zn). All site soil samples in crop fields pH shows moderately alkaline to strong alkaline. Maximum site crop field's soil samples shows average electrical conductivity some sites soil samples shows more than average electrical conductivity. Organic carbon shows fluctuate ranges from ≥ 1.00 ≤ 0.81-1.00 ≤ 0.51-0.80≤ 0.41-0.50≤0.21 to 0.40. Nitrogen content shows ≥140-280 ≥140, Phosphorus content shows ≤8-14, ≤7.00, kg/hector Potassium content ≥300 kg/hector shows all sites abundance in amount. All sites crop field's soils shows luxuriant amount of sodium content. $CaCO_3$ content shows medium to abundance in quantity in all sites. In case of micronutrients analysis shows as low ranges of Fe, Mn, Zn, and Cu in ppm all sites crop field's soil samples. In modern agriculture excess use of chemical fertilizers affects the pH, EC, Organic carbon, N, P, K, Na, and $CaCO_3$.More than average 1.00 Electrical conductivity which are harmful for germination. Due to overdose of chemical fertilizers its affects soil fertility resulted to decreases crop yields production.

Keywords: Physico-chemical analysis, crop fields, parameters, Baramati, Pune, Maharashtra

44. D.C. conductivity studies of lithium chromium ferrite

S N Kulkarni, R A Shaikh, B K Chougule, J R Nagarale

Doodhsakhar Mahavidyala, Bidri, 416208.
Department of physics, Bidri, 416208

E-mail: jyotinagarale20@gmail.com, ksudhirn@gmail.com

ABSTRACT

Fine powder of ferrite samples with general formula Li 0.5 Fe 2.5 – X Cr X O 4 (X = 0.1, 0.2, 0.3, 0.4, 0.5) were prepared by standard ceramic method using analytical reagent grade Fe 2 O 3 , Li 2 CO 3 and Cr 2 O 3 . The electrical resistivity of lithium chromium ferrite with temperature is calculated. Curve of Log() versus 10 3 /T seems almost linear up to curie temperature. The resistivity goes on increasing with addition of Cr 3+ values calculated are 7.3, 7.51, 7.65 and 7.82 in order of 10 9 ohm-cm at RT. Activation energy for conduction in the paramagnetic and ferrimagnetic region calculated. The activation energy in the para region is always greater than the activation energy in ferri region. The activation energy is also found to increase with chromium content.

Keywords: Ferrite, activation energy, curie temperature, electrical resistivity, conductivity etc.

45. Plant extract mediated Synthesis of silver polypyrrole nanocomposite for photo catalytic applications

Sachin A Khade [1], Sunil Nirmale [2], Akshay Gurav [3]

[1] Sanjay Ghodawat University Atigre, Kolhapur,
[2] School of Nano science and Technology, Shivaji University Kolhapur,
[3] Department of Chemistry, Shivaji University Kolhapur.

Corresponding author: khadesachin2@gmail.com

ABSTRACT

The present study reports shows that successful synthesis of SiverPolypyrrole(Ag- PPy) nano composite using neem plant leaf extracts as a chelating agent and porrole , silver nitrate as precursor in presence of ammonium per sulphate as a oxidising agent. The synthesized powder was gray black in color and dried at room temperature for 3 hours to obtained Siver Polypyrrole(Ag-PPy) nano composite Characterised by UV spectroscopy, X- ray diffraction, scanning electron microscopy(SEM), and Fourier transform infrared spectroscopy(FT-IR) were used to study the structure and morphology of the nanocomposite. Absorption peak in UV at 459 nm shows presence of Ag-PPy and 410–550 nm is attributed to the overlapping of the π-π* transition of polypyrrole. Powdered X-ray diffraction patterns revealed that Siver Polypyrrole(Ag-PPy) nanocomposite with an average crystallite size of 30 nm were synthesized. Scanning electron microscope images show that flower morphology and EDS data proves that presence of silver naoparticle. Fourier transform infrared spectrophotometer analysis revealed that The broad band in the region between 3000 and 3500 cm−1 corresponds to stretching of N–H bond.The synthesised nano catalyst investigated for there photo catalytic activity.

Keywords: Plant extract, silver polypyrrole nano composite, photocatalst.

46. Bioactive constituents, antioxidant activities and in vitro propagation of unexplored medicinal plant

Shreedhar S. Otari [1], Suraj B. Patel [1], Savaliram G. Ghane [1]

[1] Plant Physiology Laboratory, Department of Botany, Shivaji University, Kolhapur, 416 004, Maharashtra, India.

E-mail: shreeotari94@gmail.com

ABSTRACT

Bacopa floribunda (R. Br.) Wettst. consist family Plantaginaceae, used for improving the intelligence and memory. Present investigation was carried out by using several solvents extracts to evaluate the phytochemicals profile (Phenolic, flavonoid and tannin content) and antioxidant activities (DPPH, FRAP, ABTS, PMA and MC). Moreover, estimation of marker compound bacoside by using RP-HPLC analysis. Results indicated that, highest TPC was noticed within aqueous extract (60.44±5.24 mg TAE/g extract) whereas least in acetonitrile (9.35±0.64 mg TAE/g extract). Acetone extract showed maximum TFC (61.44±2.94mg CE/g extract) while minimum (26.11±1.75 CE/g extract) in water extract. Highest TTC was reported from acetone extract of B. floribunda (256.8±7.73 mg CE/g extract) while acetonitrile extract (135.6±6.20 mg CE/g extract) found lowest. In antioxidant activities, the highest DPPH (54.75±1.08 mg AAE/g PM) and FRAP (79.38±0.54 mg Fe (II)/g PM) activities were found in acetonitrile extract, while ABTS (13.29±0.53 mg TE/g PM), PMA (127.7±0.51 mg AAE/g PM) and MC (202.6±4.38 mg EDTA/g PM) activities noted superior in acetone extract. Further, RP-HPLC analysis confirms presence of marker compound bacoside in methanol extract of B. floribunda, identified as Bacoside A3 (0.36±0.01), Bacopaside 2 (0.37±0.01), Bacopaside X (0.42±0.01), Bacopasaponin C (3.88±0.25 mg/g PM) content. A rapid and efficient plant propagation system through node and leaf was developed for conservation of B. floribunda by using MS medium supplemented with various plant harmones. From present findings it strongly recommends that B. floribunda can be used as potent bioresource and it can be further explored for pharmaceutical purposes and the developed in vitro protocol can be successfully used for large scale multiplication and conservation.

Keywords – *Bacopa floribunda*, Invitro, HPLC, antioxidant

47. Properties of Tin Oxides thin film by Vacuum Evaporation Method

Shital P. Patil[2, *], Sarika P. Patil[2], V. R. Puri[1]

[1]Department of Physics, Shivaji University, Kolhapur, India-416004.
[2]Department of Physics, Sharad Institute of Technology, College of Engineering, Yadrav, Kolhapur, India-416121.

E-mail: shitalpatil@sitcoe.org.in

ABSTRACT

The tin thin films of various thicknesses (103nm-496nm) were deposited on alumina substrate by vacuum evaporation technique. These films were thermally oxidized in air at different temperatures (160°C, 200°C, 250^{0}C and 300°C). These films were characterized by XED and SEM. X-ray diffraction studies shows tin oxide thin films are in normal tetragonal rutile phase. Surface morphology of tin thin film shows granular shaped particles and tin oxide thin film shows uniform granular shaped particles. The dielectric constant was measured using waveguide slotted section. The microwave dielectric constant of these tin oxide thin films varied from 1.6 to 1.78 at 12 GHz and was dependent on thickness and oxidation temperature.

Keywords: Microwaves; Permittivity; Tin oxide, X-ray diffraction.

48. Purification and partial Characterization of Antimicrobial peptide from Bacteria.

Vikramsinh B. More, Kailas D. Sonawane*

Department of Microbiology, Shivaji University, Kolhapur, MS, India

E-mail: vikramsinh95m@gmail.com, kds_biochem@unishivaji.ac.in

ABSTRACT

Currently antibiotic resistance problem alarmingly increased in the society which leads to hazardous effect on human health. So it is necessory to search for natural origin resources for the overcome antibiotic resistance problem. Antimicrobial peptide (AMPs) have a wide range of inhibitory effects against bacteria, fungi, parasites etc. Antimicrobial peptides (AMPs) are a class of small peptides that widely exist in nature and they are an important part of the innate immune system of different organisms. Current study focused on the isolation of antimicrobial peptide producing bacteria from soil, production, purification and partial characterization of antimicrobial peptide from isolated bacteria.

Keywords: Antimicrobial peptide,Column Chromatography,Zone of inhibition,Drug resistance

49. New Species of Genus Argina (Lepidoptera: Arctiidae) from Western Ghats of Maharashtra

Vishnu Y. Kadam[1], Rajendra V. Salunkhe[2*] and Sanjay K. Gaikwad[3]

1st. Head Department of Zoology, Bharati Vidyapeeth's Matoshri Bayabai Shripatrao Kadam Kanya Mahavidyalaya, Kadegaon Dist. Sangli-415304, India.
2nd. Department of Zoology, Arts, Science and Commerce College, Indapur, District Pune-413106, Maharashtra, India. Author for correspondence
3rd. Department of Cell and Molecular Biology, Rajiv Gandhi Institute of IT and Biotechnology, Bharati Vidyapeeth, Pune-411046, Maharashtra, India.

*(E-mail: vykadam333@gmail.com)

ABSTRACT

Arctiidae is a large and diverse family which contain 11,000 species worldwide, So many species are unknown for its morphometric study. In this work, *Argina kolhapurensis* species morphometric study is described for the first time. The species were collected from Western Ghats of Maharashtra Kolhapur and Satara. Collected species were reared in the laboratory condition and allowed to fed ˜with fresh leaves of its host plant*, Ficus religiosa, Pakur, Ficus* spp. . Morphometric study i.e. study of head, thorax and abdomen was studied in laboratory condition and compared with the *Argina syringa* Cramer (Hampson,1976).

Key words- Lepidoptera: Arctiidae**,** *Argina kolhapurensis*

50. Significant roles of ground based remote sensing phased array Doppler SODAR in the study of atmospheric boundary layer dynamics

T.Y. Landage[1], D.P. Nade[2], R.P. Pawar[1]

1Sanjay Ghodawat University, Kolhapur, India
2 Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalay
(Shivaji University, Kolhapur), Sangli, India

ABSTRACT

Sonic Detection and Ranging (SODAR) provides wind assessment process for many of needs in research of wind energy and study of Atmospheric Boundary Layer (ABL) dynamics to deal with weather pattern and forecasts modelling. The SODAR is ground based sensing device can measure the timely data collected in a day for 24 hours. This data especially useful to deal with dynamics with different layers of the ABL that is Nocturnal Boundary Layer (NBL) and Convective Boundary Layer (CBL). Furthermore, about the measuring parameters wind speed, wind direction, turbulence and echograms which gives the accurate predictor model required for atmospheric research. The phased array SODAR PCS.2000-64/MF, Metek device which works on the principle of Doppler effect. This SODAR having phased acoustic antenna transmits frequency 1 to 4kHz (adjustable) to ABL, at a instant same pulse is reflected back to the receiver. The wind direction, wind speed and turbulent structure depending on sonic frequency, output power, stability of atmosphere are determined by using Doppler shift of backscattered signal at lower atmosphere approximately 2km. The local circulations within boundary layer due to discrete time and space resolution SODAR has proved its role. Moreover, it is useful in getting high resolution wind fields of the lower atmosphere, wind shear required for thunderstorms, turbulence intensity in the atmosphere.

Keywords: SODAR, Atmospheric Boundary Layer (ABL), wind velocity, Doppler effect, NBL, CBL, wind shear

51. Investigation on electrical properties of CuO-NiO-GDC anode in biogas for ITSOFCs

Sarika P. Patil[1,2*], Shital P. Patil[1], L. D. Jadhav[2]

[1]Department of Basic Sciences and Humanities, Sharad Institute of Technology College of Engineering, Yadrav, Kolhapur, Maharashtra, India.
[2]Electrochemical Energy Materials Laboratory, Department of Physics, Rajaram College, Kolhapur, India-416004.

Corresponding author: sarikapatil@sitcoe.org.in

ABSTRACT

This paper reports, the formation of CuO-NiO-GDC composite using combustion synthesized powders. The graded anode is characterized by XRD and the dc conductivity of anode is measured in hydrogen as well as in biogas. The dc conductivity of NiO-GDC and CuO-NiO-GDC anodes in biogas at 610 ^{o}C are 2.4 x 10^{-3} S/cm and 35 x 10^{-3} S/cm, respectively. The results demonstrate biogas (methane) reformation without coke formation. The single IT-SOFC CuO-NiO-GDC/GDC/LSCF can achieve highest power density 11.38 mW/cm^2 and highest current density 31.68 mA/cm^2 at 800^{o}C.

Keywords- Graded anode, Composite, Biogas, Dc conductivity, Triple phase boundary.

52. Synthesis and characterization of Dysprosium Selenide (Dy_2Se_3) thin films by using simple successive ionic layer adsorption and reaction SILAR method

S. D. Khot[1], D. B. Malavekar[1], R. P. Nikam[1], S. B. Ubale[1], P. P. Bagwade[1], C. D. Lokhande[1]*

[1]Centre for Interdisciplinary Research, D. Y. Patil Education Society,
Kolhapur, India 416 006

E-mail: l_chandrakant@yahoo.com

ABSTRACT

Nowadays, in energy storage system supercapacitor is widely used. As a result, many scientists around the world are trying to enhance performance of supercapacitor by using different types materials. Account of this, in this study, dysprosium selenide (Dy_2Se_3) is deposited on the stainless steel substrate by simple successive ionic layer adsorption and reaction (SILAR) method at room temperature and characterized using different physico-chemical techniques such as X-ray diffraction (XRD), Fourier transforms infra-red (FT-IR), contact angel, scanning electron microscopy (SEM) and energy dispersive spectroscopy (EDS) techniques. The structural and morphological studies are done using XRD patterns and SEM images respectively. XRD patterns and SEM images reveal the synthesized electrode shows orthorhombic crystal structure and formation of spherical nanoparticles of Dy_2Se_3 thin film respectively. Hence, the XRD and EDS results confirm the formation of Dy_2Se_3 thin film.

Keywords: Dysprosium selenide; Successive ionic layer adsorption and reaction (SILAR) method; Thin film

53. Chemical synthesis of CuO nanostructures for electrochemical supercapacitor

Rutuja Gurav[12], Balaji Salokhe[2], Suhasini Yadhav[2], Kishor Gurav[2], Sarita Patil[1]

1Department of physics, Sanjay Ghodawat University, Kolhapur

Email: sarita.patil@sanjayghodawatuniversity.ac.in

2Energy Conversion and Storage Research Laboratory, Department of Physics, Devchand College, Arjunnagar, Affiliated to Shivaji University Kolhapur

E-mail: kvg.ecs2019@gmail.com

ABSTRACT

Herein, we report synthesis of one dimensional (1D) copper oxide [CuO] nanorods thin film by chemical bath deposition method (CBD). The synthesized film is characterized for its structural, chemical, surface morphological properties by means of X-ray diffraction (XRD), Fourier transform infrared (FT-IR) and field emission scanning electron microscopy (FE-SEM), respectively. The XRD analysis shows the deposited film having monoclinic crystal structure. Formation of copper compound with oxide phase is confirmed by FT-IR study. The FE-SEM analysis reveals the growth of CuO 1D nanorods. Moreover, FE-SEM micrograph shows the entire surface of the substrate is uniformly covered by CuO nanorods. The CuO nanorods electrode exhibits highest specific capacitance 207 Fg-1 at 10 mVs-1 in 1M KOH electrolyte, which demonstrates that the 1D CuO nanorods can effectively be used in supercapacitor applications.

Keywords: CuO nanorods, CBD, Supercapacitor.

54. Bismuth Chromate (Bi_2CrO_6): A Promising Semiconductor Photocatalyst under Natural Solar Radiation

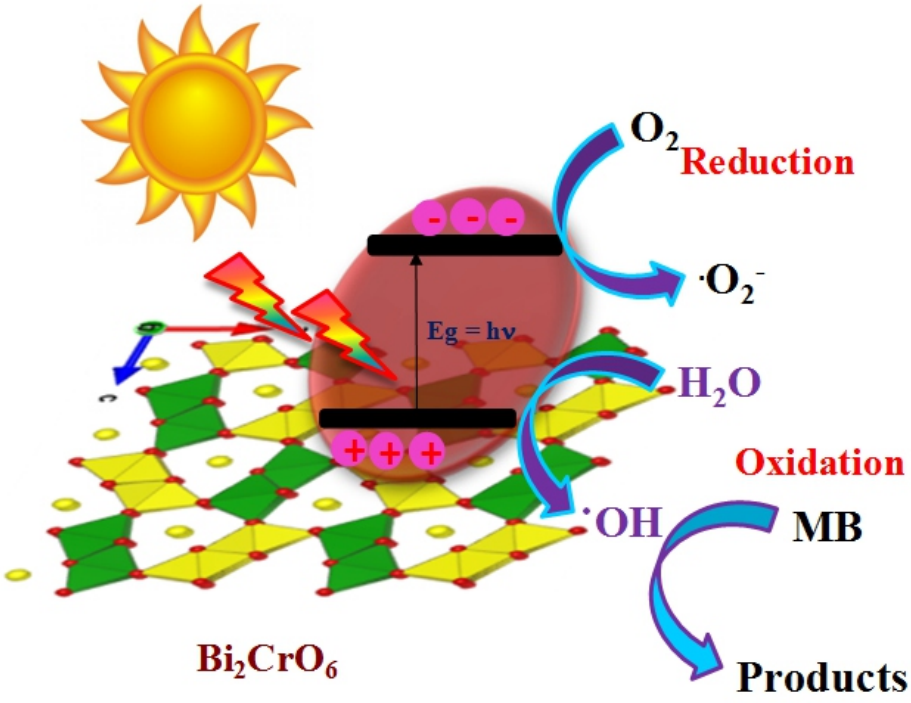
Ruth Madhale[a], Deepali Shinde[b], Sangram Salve[a], D. S. Bhange[b] and Pallavi Bhange[a]

[a]School of Sciences, Sanjay Ghodawat University, Atigre, Kolhapur-416 118, India.

[b]Department of Chemistry, Shivaji University, Kolhapur 416004, MS, India

ABSTRACT

Bismuth chromate, a semiconductor in the bismuth-based materials family was successfully prepared by hydrothermal method. This Bi_2CrO_6 semiconductor exhibits high solar and visible-light responsivity, making it a promising candidate for photocatalysis under solar light. This material exhibits a narrower band gap (2.00 eV), wider responsive wavelength range of the solar spectrum (up to 620 nm) and one-dimensional morphology



Scheme 1

55. Effect of Boron and fluorine doping on ZnO Thin films

S. C. Yadav[1], M. D. Uplane[2]

[1], Head & Asst Professor, Miraj Mahavidyalaya, Miraj

[2], Professor Savitribai Phule Pune Univ.

ABSTRACT

Undoped, fluorine and boron-doped ZnO thin films have been prepared at 220 °C by using Spray CVD technique. The structural, optical, electrical, and luminescence properties of the films have been investigated. X-ray diffraction (XRD) patterns reveal that as deposited thin films have hexagonal wurtzite type structure with (002) preferential orientation. The crystallite size have been calculated by Debye–Scherrer and Williamson–Hall method. Transmission spectra show transmittance above 90% indicating high average optical transmittance. Photoluminescence (PL) spectra of the films shows green emission and UV emission band. FESEM micrographs reveal triangular pyramid shaped morphology of undoped ZnO thin films. However doping shows transition in morphology from triangular columnar pyramids to cluster of islands, nanospheres, and finally into petal shaped morphology. The electrical resistivity, carrier concentration and Hall mobility have been measured.The results are in well agreement for optoelectronic industry and photovoltaic solar cell applications.

56. CHANGE IN STRUCTURAL AND DIELECTRIC PROPERTIES OF $COFE_2O_4$ FERRITE DUE TO SM DOPING

Aditi Yadav[1], Rutuja Patil[1], C.M. Kanamadi[2]*, and Sarita Patil[1]*

[1]Sanjay Ghodawat University, Kolhapur, 416118(M.S.) India.
[2]Devchand College Arjunnagar, affiliated to Shivaji University, Kolhapur 416004, (M.S.), India.

Corresponding author: sarita.patil@sanjayghodawatuniversity.ac.in

ABSTRACT

Amongst different spinel ferrites, cobalt ferrite is a well-known inverse spinel structured hard magnetic material with high coercivity, moderate magnetization and highest magnetocrystalline anisotropy. The doping of rare earth (RE) in cobalt ferrite not only makes the structural distortion but also impact largely on its properties. In present work samarium doped cobalt ferrite, ($CoSm_xFe_{2-x}O_4$) in which x varies as 0.0, 0.1, 0.2 0.3, 0.4 and 0.5 were synthesized by conventional solid state reaction method. The impact of samarium doping on structural and dielectric properties is studied. The crystalline structure and phase formation is confirmed by using XRD technique. The reflection peak broadening increases with increase in Sm concentration. The grain size is calculated by using scanning electron microscope image. The variation in dielectric constant () and dielectric loss (tan) as a function of frequency in the range 20 Hz to 1 MHz was studied. The dielectric constant is enhanced with increase in Sm concentration and decrease with increase in frequency.

57. Histological observation on the Fifth instar larval testis of tasar silkworm Antheraea proylei J.

Varsha Kumbhar

Department of Zoology,
Bharati Vidyapeeth's Dr. Patangrao Kadam Mahavidyalaya, Sangli

E-mail: varshakumbhar2@rediffmail.com

ABSTRACT

Antheraea proylei J (Indian Oak Tasar silkworm) an interspecific hybrid between Antheraea roylei Moore of India and its Chinese counterpart Antheraea pernyi Gm. is being used for production of Oak tasar silk. The male reproductive systems generally consists paired gonads connected to median duct leading to the gonopore In the first three instars, testis on the basis of their shape cannot be distinguished. But from the fourth instars onwards testes in the male larvae assumed bean shaper kidney shape. In Antheraea proylei the testis of fifth instar larvae are present dorsolaterally in the 6th abdominal segment attached to the main spiracular tracheal trunks of that segment. Histologically testis is externally surrounded by a peritoneal sheath with small rounded nuclei. The external layer is made up of connective tissue differentiated in to outer tunica externa & inner tunica interna. Each larval testis of Antheraea proylei consists of four distinct testicular follicles which are externally surrounded by two epithelial covering.

Keywords: Antheraea proylei, Testis, Tasar silkworm

58. Biodiversity of Diatoms from Wai Tahasil, Satara district (Maharashtra).

Manjusha Ingawale

Department of Botany, Kisan Veer Mahavidyalaya, Wai.

E-mail: manjushaingawale15@ gmail.com

ABSTRACT

The present investigation accounts on the biodiversity of some members of Bacillariophyceae collected from water bodies of Wai tahasil**.** The study period of 12 months duration from June 2016 to May 2017 revealed the presence of twenty eight diatoms belonging to two orders Centrales and Pennales. A limited number of these were recorded throughout the year, while others were distributed in different seasons mainly in winter and summer. These species belong to sixteen genera namely *Melosira, Cyclotella*, *Achanthes, Fragilaria, Ulnaria, Gyrosigma*, *Stauroneis, Pinnularia, Navicula, Surirella, Gomphonema, Enunotia, Hantzschia, Nitzschia, Cymbella, Amphora.* This study concludes that the diatom species attain maximum growth in post monsoon and winter months and gradually declines in summer to reach its minimum during monsoon.

Keywords: *Diatoms, Bacillariophyceae, Wai, Satara.*

59. Plants as a biological indicator of air pollution in corporation areas of Sangli, Miraj and Kupwad. (Maharashtra)

Vikas Awale, Harshal Wangikar and Mangesh Gavit

Department of Botany, Bharati Vidyapeeth's, Dr.Patangrao Kadam Mahavidyalaya, Sangli.

E-mail: vikasawale@gmail.com

ABSTRACT

Increasing industrialization and anthropogenic activities is the main agent of pollutant discharge into the environment and introduce various harmful substances into the atmosphere. These pollution effects adversely on plants directly and/or indirectly. Leaf surface in plants undergoes several structural and functional changes when particulate –laden air strikes it. An attempt was made to evaluate the quality of air in terms of respirable suspended particulate matter (RSPM), suspended particulate matter (SPM), sulphur dioxide (SO_2) and Nitrogen dioxide (NO_2) along with biochemical parameters of ten selected road side plant species at industrial, traffic, residential and surrounding areas of SMK Corporation. Increased concentration of heavy metals (Fe, Cu, and Zn) was recorded at site A (industrial area). Considerable reduction in chlorophyll, sugar and protein contents were observed at sites receiving higher pollution load. The variation in heavy metal concentration and enzyme activity (e.g. Catalase, Peroxidase) were found to be pollution load dependent sites. Suggestion of activation of protection mechanism in studied plants under air pollution stress.

Keywords*:* Air quality, heavy metals, Pollution, bio-indicators.

Bharati Vidyapeeth's

Dr. Patangrao Kadam Mahavidyalaya, Sangli

Post Box No. 74, Sangli - 416 416, Phone: (0233) 2535229